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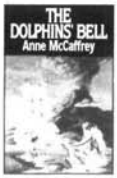

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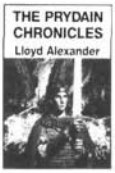

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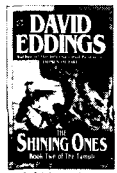

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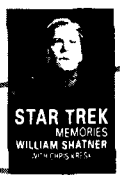

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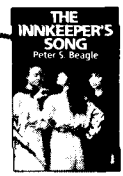

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May 1994

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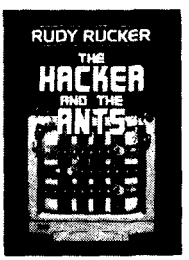

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GUEST EDITORIAL G. David Nordley

DO BOOMBA COUNT?

Once upon a time there was a planet named Green which was inhabited by, among many other species, the twin-trunked, pachydermoid Boomba. Now, once born, a Boomba breeds every Greenian year and lives forever unless it starves to death or gets eaten by a Brobdingnag (a relative of the Bandersnatch, for you Niven fans). Therefore, the total Boomba population depends only on its birth rate and its ability to avoid being snatched or starved.

But there was racism amongst the Boomba; some were red and some were blue, and the Reds wouldn't breed with the Blues. There was no overt hostility between the Boomba; each individual negotiated equal access to Boomba grass, and when they met they simply went their separate ways, sticking their twin trunks up in the air if they saw the other was the wrong color (the notion that they smell different is an old cow tale). Both reds and blues were equally good at survival because both the Brobdingnag and Boomba grass are color blind. But the Blue Boomba were responsible breeders, having only two little (about three metric tons) Boombitos on average each year for every ten Boomba, while the Red Boomba let nature take its course and usually had three.

Now the ecology of a certain Greenian island will support only, on average, twenty Boomba and one Brobdingnag. So, however many are born in one year, only twenty will survive to the next breeding season. A federation survey vessel, under the command of one Captain Clerk, happened across this island in 2535 and counted ten Boomba of each color, which the good captain duly and dryly noted in his log. Can you guess what he found when he returned in 2575?

If you've looked ahead to Table 1, you already know. There was only one Blue Boomba left, which Captain Clerk observed with due vigilance

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until its unfortunate demise.

How could this be? Who did in the Blue Boomba? Was the supposedly colorblind Brobdingnag playing favorites somehow?

No, the culprit was simple mathematical logic. It has nothing to do with genetics, biology, or discrimination, or even individual merit. But year after year there were more Red and fewer Blue Boomba until the blue were gone for good: yes, sad to say, the Brobdingnag got the last one eventually (even if it had *wanted* to preserve the race, it couldn't tell the difference and would eventually have eaten the last Blue by random chance).

Let us then retrospectively chart the decline of the Blue Boomba. Table 1 illustrates this very simple problem in evolutionary mathematics. As we follow along the row labeled Breed Year 1, we find the ten Reds

Table 1. The Decline of the Blue Boomba

Breed Year	Surviving *Boomba*		Births per year *per Boomba*		Peak Population *(after breeding)*		Survival Rate
	Reds	Blues	Red	Blue	Red	Blue	
1	10	10	0.3	0.2	13	12	0.800
2	10.4	9.6	0.3	0.2	13.5	11.5	0.799
3	10.8	9.2	0.3	0.2	14.0	11.0	0.797
—	—	—	—	—	—	—	—
10	13.4	6.6	0.3	0.2	17.5	7.86	0.789
—	—	—	—	—	—	—	—
20	16.4	3.6	0.3	0.2	21.3	4.3	0.780
—	—	—	—	—	—	—	—
30	18.2	1.8	0.3	0.2	23.7	2.15	0.775
—	—	—	—	—	—	—	—
39	19.1	0.9*	0.3	0.2*	24.8	1.09*	0.772

*The last Blue Boomba couldn't breed, of course.

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had their average three babies and the ten Blues had their average of two. That momentarily lifted the total species population to twenty-five.

But the grim reaper must have his share, and only eighty percent (0.8) survived into the next breeding season, Breed Year 2. I've defined the "survival rate" as the average "Sustained Population" (20) divided by the total after birthing (25, in Breed Year 1). To get back to twenty, death took five Boomba, in strict proportion to their numbers: 2.6 Reds and 2.4 Blues. God is not a racist! The population of twenty now consists of 10.4 Reds and 9.6 Blues.

Now, as even four-tenths of a Boomba cannot be ignored (I didn't say they *don't* stink—it's just that they all just stink the same!), one has to understand that this is all on average—if two Blue Boomba die over five years, well, that's four-tenths of a dead Boomba per year, thank you. And if there are two Blue Boomba left, and it takes them five years to make a Boombito, well, that's a normal two-tenths of a Blue Boomba per year. Of course when you get down to just one....

Having grasped the significance of fractional Boomba, we can skip down to Breed Year 10 and find that, already, the handwriting is on the wall. Now there are about thirteen reds and seven blues whereas we started with ten of each!

And another strange thing is happening here; the survival rate has *decreased* from 80 percent to 79 percent. With the increasing number of

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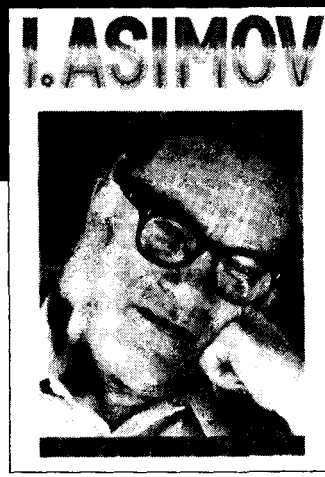

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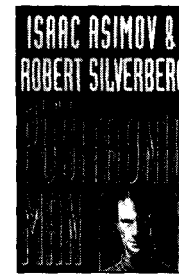

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Reds versus Blues, the Boomba population is becoming more fecund in general. Since there is only room for twenty Boomba, and everyone shares equally, the grim reaper must, undiscriminatingly, take a little more of the Red and Blue herds each year to bring the ecology back into balance. Not as much grass to feed all those Boombitos and hunting is a little easier for the Brobdingnag, perhaps. It doesn't really matter *as long as the population limit remains the same.*

After 20 Breed Years, there were only four Blue Boomba left—but they lingered on for a surprisingly long time; the Brobdingnag usually found something else. So the survival rate stabilized at about 77 percent because it was now being pretty much determined by the Reds' steadily profligate birth rate. Not enough Blues left to matter.

The end, however, was sad, and not at all properly reflected in the average statistics at the bottom of figure one. The Brobdingnag surprised the last pair of Blue Boomba, and the male, being only a dumb animal and not realizing they *both* had to survive, sacrificed himself for his pregnant mate with a magnificent charge which gored the inside of the Brobdingnag's mouth so badly that it couldn't eat for half a year after *painfully* digesting the last great Blue Boomba male. Sadder still, the calf born in 2570 was sickly and couldn't keep its Boomba grass down, dying in the next year. The cow lingered on to be one of Captain Clerk's statistics before she, too, finally became a Brobdingnag meal. Captain Clerk's usually reliable journal reports that she simply turned her head and made no effort to flee or resist, thus joining her mate wherever Boomba go.

So. The Boomba on the island comprise an excessively simple ecological model; they don't die of old age and they breed *right away* so we don't have to keep track of the age spread. The Brobdingnag is a steady hunter and its population of one doesn't fluctuate (except in girth), so we don't have to worry about oscillations in prey/predator relationships. And so on. In fact this model is so simple that *any reader with a calculator can verify what's happening.*

Too bad that the Boomba couldn't count, but at least *you* don't have to take my word for it.

Which is important, because this simple model makes a big dent in "what everybody knows" about evolution. Survival of the fittest? Blues and Reds, as individuals, survive equally well. Competition? At worst, each individual has about 20/26 of its normal food supply, and the Reds are hurting just as bad as the Blues.

No, where there are resource limits on a population and everything else is equal, a simple difference in fertility can *wide out* an otherwise equal subspecies of biological immortals in just a few years. If we were talking about an intelligent species, this would be genocide.

The Blue Boomba vanished from their island in the twinkling of a geological eye, which should give pause to those who feel that any sudden changes must be *only* the work of irresponsible intelligence or celestial

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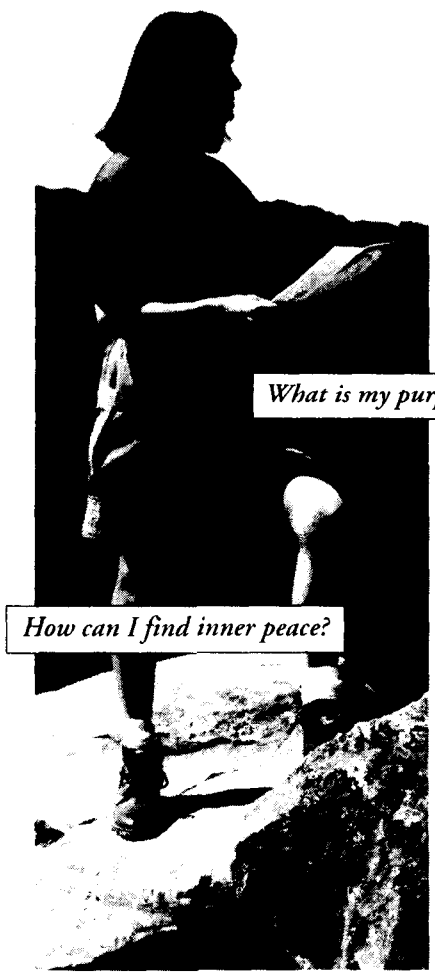
The Answers to Life's Questions are Closer Than You Think



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catastrophes.

The mathematical logic of the Blue Boomba decline should give pause to those who want to nitpick the concept of evolution on the basis of not having all the genetic details wrapped up in a pretty DNA ribbon. As long as a biological (or any other) system obeys certain mathematical ground rules, it *will* evolve. It doesn't really matter *why* it obeys the ground rules unless you're looking for a change in those ground rules.

And finally, do Boomba, or any more or less distinct biological phenomena count for anything in the overall order of things? A matter for debate, to be sure. But if we are serious about maintaining the ethnic, cultural, and biological diversity of another species named *H. sapiens* without unacceptable controls on individual freedom, we'd better get off this planet. Soon. ■

SCIENCE FICTION AT WORK

This month's cover is science-fictional in more ways than one. Chances are that you looked at it and assumed it was a finely detailed acrylic or oil painting; but in fact, with the exception of some of the mountains which were incorporated from earlier manual work, the entire picture was produced and revised on a computer. Specifically, artist George H. Krauter used the programs Adobe Illustrator 5.0, Photoshop 2.5, and Stratavision 2.5 on a Macintosh. Less than two decades ago, computer graphics of this quality existed only *in* science fiction; now they're being used routinely—and impressively—to illustrate it!

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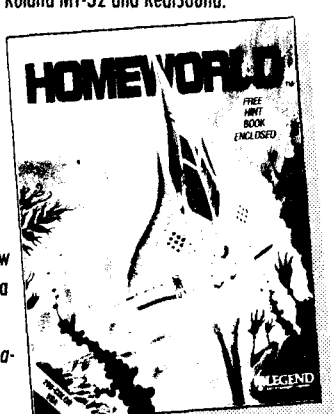

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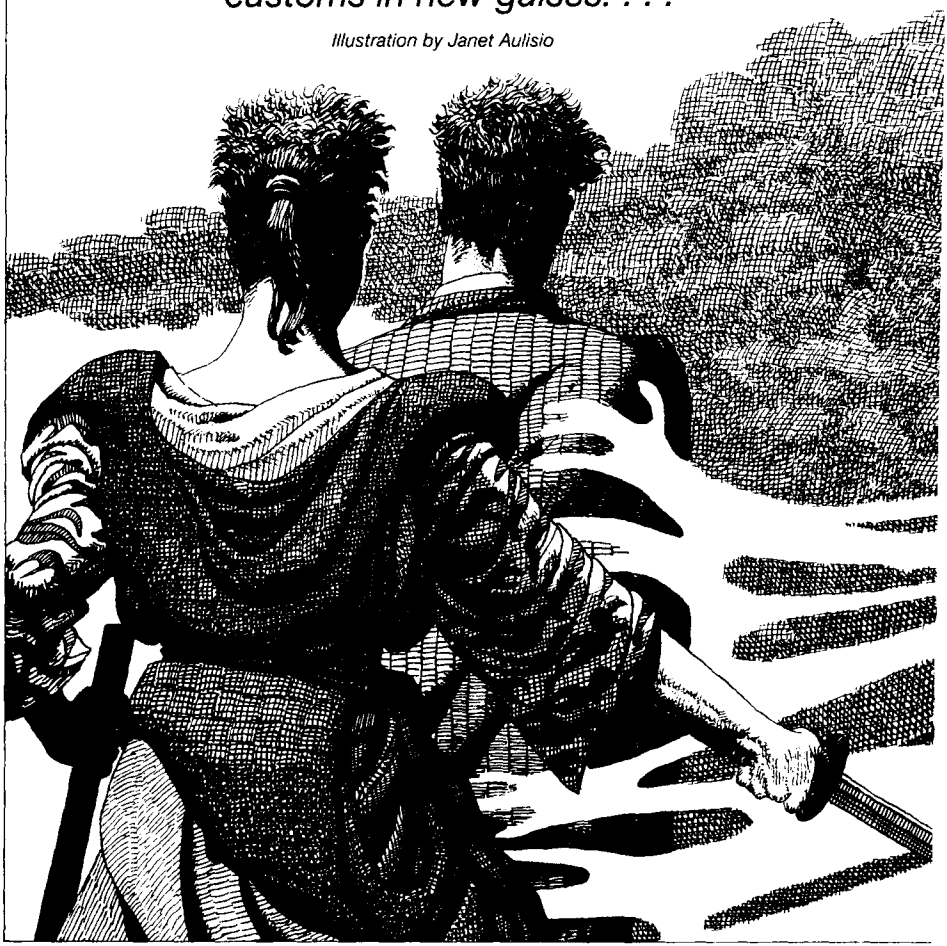

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She spotted him almost at once. In the dining room of an average Holiday Inn, in an almost disreputable part of town, he stood in marked contrast to the dreary assortment of microchip salesmen in their unimaginative blue suits and matching obis. The proper place to entertain business guests was the main dining room of the Dai Ichi, fourteen blocks farther west. And the proper place to house them was *not* the dog-eared Statesman, five dark blocks east of here. But that was where her latest clients had arranged for her to stay.

Tessie eyed him appreciatively. A shade under two meters, hair just drifting into salt and pepper, he exuded the comfortable power of a long-profitable businessman. Dressed with almost continental stuffiness, he would be more comfortable in the lobby of a Mayfair hotel. *Yes,* Tessie decided, *Randall Santee is definitely old money.*

So what the hell is he doing shopping for an assassin?

Tessie sighed her wistful little-girl sigh. In a simpler place and time he would be the catch of the century. She played the secret maiden's game with winsome frivolity. *Tessie Luellen Santee. No, Tessie Crocker Santee. No, Tessie Luellen Crocker Santee.* Yes, that would be how her stationery would read. Her mama could wave the mauve (no, *beige*) tinted letters under every envious female nose in the Blue Ridge Mountains.

She sighed another sigh and tucked the little girl in for the evening.

The person who presented herself

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to Randall Santee was all business. A slender woman with that self-assured beauty that could mean forty-five years almost as easily as her twenty-five, she dressed with an expensive simplicity as out of place there as he was. She wore low heels and a gently clinging knit, the sexy sway and accented curves barely masking an athletic tautness. Her handshake had a measured firmness that showed she knew men's undocumented rules.

If Santee was surprised to find that T.L. Crocker was a woman, he hid it with adequate grace. That he found her attractive was apparent from the undisguised twinkle in his eye and his reluctance to part with her hand. But he was also a businessman, engaged in a business he had to find distasteful. Her ability to help him was more important than her looks.

The little girl stirred, caught up in a romantic dream. Tessie firmly ordered her back to sleep.

"Mr. Santee, it's a pleasure to meet you at last." She knew how to use her Virginia accent to maximum advantage. It could insinuate coquetry without deviating five degrees from prim formality.

"I must say, it's more of a pleasure for me than I expected." The rich baritone caught her by surprise. He may have been Yankee born and bred, but his years at Duke resonated in that wonderful voice. Here was a man wise to the subtle ways of the Southern belle. The twinkle had not left his eye.

"I must apologize for the choice of accommodations," he continued smoothly. "Our CFO has a way of cutting corners in inappropriate places. Would you prefer that I help you relocate before dinner? Or should we find a suitable restaurant first, then deal with your bags later?"

Tessie smiled inwardly. He had shifted gears so deftly. Perhaps the chief financial officer *had* placed her in that fleabag without consulting him. Santee didn't strike her as the sort to shift blame from himself to a subordinate. But both knew that their dinner reservations were here at the Holiday Inn.

It was probably simple chivalry that earned her the sudden elevation in status. Nevertheless, Tessie had long ago learned to seize every advantage. Life was rough, especially since The Deflation. She needed this business, and she needed to negotiate it from a position of strength. Her mind began sifting through the lists of upscale eateries she kept for most major cities.

Then the old perverse streak woke up. She resented this man presuming to take care of her. She bridled at the control he exercised in the name of chivalry. Sure, she had a choice. But either choice was one predetermined by this—*client*. The words rose unbidden, dragging her chin upward with their passage.

"I believe that I am adequately housed, sir." God, was she ever the Southern bitch! "I thank you for your consideration, but I prefer the current arrangements. Shall we dine?" She walked past him to the reservations desk, leaving him in her wake.

He caught up barely in time to save the restaurant manager an awkward

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choice. Should he address this resolute young woman descending on him? Or should he wait for the gentleman who was so clearly her dining companion?

Santee resolved the dilemma by a casual gesture over Tessie's head. It was that soundless snap of the fingers that signals self-assured control. The manager fixated on it like a newborn duckling.

"Sir?"

"Santee. Party of two for dinner."

"Certainly." The manager palmed two oversize menus from behind the piano lamp and turned to lead the way. Tessie's fingers instinctively brushed the mock lectern and its rack of menus as she passed. Formica and textured plastic. For a wild moment, she wondered where such pretentious props came from. Was there a central factory in Lisle, Illinois that turned out equipment for hopelessly aspiring third-rate restaurants? Again she gave herself a mental rebuke. *Stay focused, Tessie.*

At least the menus were all in English. The image of the menu rack lingered in her mind's eye. Yes, the Kanji ones would be the fancier jobs at the back of the rack. Probably not used much here. Tessie ordered broiled bluefish and a salad—skip the miso, thank you—perhaps a bit more decisively than was her usual wont. Santee did the same and suggested a better than average California chablis. She accepted.

Suddenly, they were at that point in a business dinner where an awkward silence threatens. The participants either must hide behind inconsequential chatter for the remainder of the meal or dive head long into business matters. Santee somehow managed to step down both paths at once.

"You don't look like a killer," he said simply.

She laughed in happy surprise at his frankness. Heads turned all around the restaurant. Lonely men and envious women bathed in the warm joy of a beautiful woman's laughter.

"That can be a distinct advantage at times." She shrugged, nodded almost imperceptibly toward two women at a corner table. "And it's better than some options."

The two were clearly "house women," the polite term for the hotel's whores in residence. Both wore the obligatory fishnet stockings and microskirts. One was buffing her nails, the other toying with a drink, as if idling away that last wee hour before quitting time. Only their shift was just beginning.

Santee was clearly discomfited by her comeback. "Surely, a woman of your talents has any number of career options." Both knew that "talents" meant "class," and "career options" meant "marriage prospects."

"Maybe," was all she said.

Then more soberly and softly, "You don't look like the kind who needs a killer." She pointedly used his vulgar term instead of the more austere "assassin" engraved on her business card.

It was his turn to shrug. He started to say something, but the waiter turned up with their salads at that point. The moment passed. They ate

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in silence.

Santee pushed his empty salad bowl aside almost impatiently. He began speaking softly and rapidly, his eyes fixed on hands folded almost in prayer. For the first time, Tessie heard that baritone voice lose its confident depth. She now knew what this man looked like when he was afraid.

"My grandfather founded Santee Castings. He shortened his name from the Greek the day he incorporated. Anything from simple building washers to brass bushings he made the best way he knew how. It was a classic immigrant success story.

"His son took over the business when Gramps hit seventy. Dad was a wild one—got thrown out of three schools. But somehow he picked up a masters in metallurgy and a head for cash management. He got us the NASA business and some secret stuff for the U.S. Navy. When government spending started dropping off, he was ready for the boom in organometallics and three-phase ceramics. You know what that means."

Tessie did and she didn't. She knew the high-tech buzz words without any real knowledge of the engineering behind them. More importantly, she knew what Suntory, Dun & Bradstreet had to say about Santee's growth through the Triple Dip and after The Deflation. It was impressive.

Their dinners came. The waiter, with rare sensitivity, set Santee's plate to one side and scurried off. He must have read the anguished intensity in those almost praying hands. Tessie tried to eat, but with little success.

"Dad died three years ago and I ended up as CEO. From a metalsmith to a metallurgist to an MBA in three generations. The usual decay of a family-run business." He smiled self-deprecatingly. Tessie knew that he believed his stock joke more than he let on.

"Still, we're in pretty good shape. Our sister company is Ishido Metals in Yokohama. They hold only a minority interest. And they actually buy more from us than we do from them."

Tessie whistled appreciatively. Not all of that information was in the SD&B report. "Sister company" was conventionally a euphemism for the feudal lord that set policy for an American company. Sort of the way the Honorable Aides gave advice and guidance to members of Congress. A positive trade flow could only mean one of two things—Ishido hadn't yet ripped off Santee's technology or Santee could deliver goods better and cheaper. Or both.

Suddenly, Santee looked up and impaled Tessie with an almost boyish grin. His eyes were brown with green and gold flecks. Her head swam.

"Now you've heard the official reason for our success. The truth, however, is that we cheat." With that, he scooped up his plate and attacked his food with refined relish.

Tessie was flabbergasted. Why was this confident man so frightened while reciting stock history, then suddenly so calm? She sensed an undertow of danger. *He's decided to trust me. That was the point of no return—probably for both of us.*

The waiter collected plates and de-

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livered coffees before Santee resumed. Now he was soberly precise, like a scientist attempting an objective report on his first acid trip.

"Dad had a mistress. She died in childbirth shortly after I was born. My bastard half-brother was an eight kilo monster, a twisted freak. Dad kept Arnie alive, I think out of love for his mother. My mother found out when we were both two. I suspect that's why she committed suicide."

He flashed his incongruous grin again. Tessie suppressed visions of ivory-laid letterhead.

"Sorry to dump the family skeletons on you over coffee. It's all relevant, believe me."

He picked up a spoon, studied his distorted reflection in its bowl.

Suddenly, "Do you know what a telempath is?"

"Why, uh, a telepath is someone who reads minds. At least in the popular literature. I know of no concrete evidence that they exist."

"Nor I," said Santee. "But what I said was 'tel-EM-path.' That's the term we use for a related phenomenon. Can't read minds, but can affect the minds of people nearby. Can't project thoughts, but can shape feelings with uncanny intensity and accuracy."

He paused. Tessie knew exactly what Santee was going to say next. She stared evenly at him until he said it.

"Arnie is a telempath."

His voice lowered with that statement. It remained pitched just above the murmur of background noise. Tessie leaned forward to hear better, caught a whiff of musky cologne. Automatically, Santee moved closer too. They could be two lovers exchanging intimacies, as far as the other diners were concerned.

"Arnie is a recluse, a social as well as physical cripple. We give him the run of Gramp's old Mansion House on the company grounds. That's where we host of all our important business meetings as well. Arnie, uh, helps those meetings run well."

Tessie could fill in the blanks. The Japanese set great store by those well lubricated social evenings where everybody makes a show of lowering inhibitions. Quite a few American firms imitated the practice, if only to ingratiate themselves to their sister companies. Picture Arnie projecting warm fuzzies at the critical moment. Customers and suppliers alike would wake up mildly chagrined at the commitments made while the wine flowed red the night before.

Such a small lever could move a world of business, particularly if the enterprise delivered quality goods in the bargain.

"Uh, Mr. Santee—" Tessie began.

"Randall, please." He covered her hand with his, left it there just beyond the bounds of cordiality. Tessie tried not to be flustered at the contact.

"Tessie, then." She shook herself, held doggedly to the ugly thought looming in her mind. "Are you about to tell me that Arnie is the subject of my visit?" They always said "victim" on the silly TV quasidocs about assassins. "Subject" was a stock euphemism that even Tessie grudgingly approved. It kept the customers from turning squeamish.

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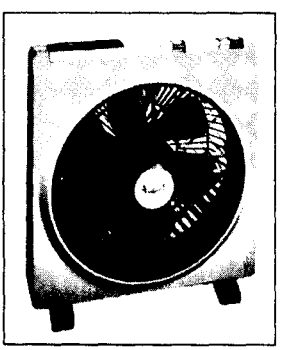

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Randall's hands came together in prayer once again. "I'm afraid so. He's gone . . . wild. It's only a matter of time before he kills somebody himself." Tessie read genuine anguish for his half brother. Her heart took another dangerous lurch.

"You realize that you're asking a lot of me," she persisted. "A talent like that could be a formidable defensive weapon." An even uglier thought loomed. "Once he finds out that I'm after him, he might even use it to mount an offensive."

Tessie had a sudden vision of herself dreaming away a golden afternoon in the park, blind to the twisted figure stalking her in the dark alleyway where she actually lay enthralled. *Could he do that? Was he that powerful?* She began marshaling a host of questions that needed answering. Mentally, she postponed the closing an extra two days.

Then the ugliest thought of all elbowed its way past the others. Randall was looking downright miserable, and it wasn't purely out of anticipated grief for the loss of his half-brother. Anger stabbed through Tessie's veins so sharply that her training cut in. In the half second it took her to frame her words, the emotional clamps bore down hard. The tigress became a catty Southern hostess.

"Why, Arnie already knows about me, doesn't he, sweetheart? You *do* know how to look after your little brother, don't you, dear?" The bleak look on Randall's face was all the confirmation she needed.

She stood, extended her hand as if to have it kissed. "And now, if you'll excuse me, I have a plane to catch." She headed for the door at a brisk but stately pace.

Randall caught up with her by the time she hit the street. God knows how he settled the bill so fast, or if he did. He reached for that spot on the upper arm where men still think it's acceptable to grab a woman. Reflexively, Tessie broke the hold, spun on him, stopped her rising palm-heel strike just a centimeter from his jaw. They stood thus, breathing heavily, eye to eye, frozen on the ill-lit street.

Randall blinked. "I'm sorry, Tessie. It was an accident. Arnie broke into an office and read some critical files. He'd never gone that far from the Mansion House before. We should have been more careful." She lowered her threatening hand, said nothing.

"If you want to leave, I can't blame you. But I hope you stay. We really need your help."

"How do you know he isn't stalking us right this minute?" *Damned amateurs. They're the most dangerous part of the job.*

"Oh, Arnie never stirs far from the Mansion House. He's afraid of open spaces."

"Didn't you just say that he invaded an office well away from the Mansion House? Why should he stop there?"

Randall's jaw opened stupidly, closed slowly. Suddenly the shadows seemed darker.

"Look, let me drive you to your hotel. My car is just down the block. You can wait here where the light is better."

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Tessie felt a roil of emotions at that pronouncement. Hadn't she just come within an ace of decking him in his tracks? Who was he to think *he* could protect *her?* Wasn't it *he* who had put *her* in danger—or his company at least?

In the end, sardonic amusement won out, with a secret happiness on its heels. She really wanted this gorgeous man to take care of her, silly as the notion appeared by the light of a sickly street lamp. She nodded assent, let him grip her arm briefly, this time as a sanitized hug. He set off down the darkened street.

Minutes passed. An alley cat skulked along the gutter. The shadows seemed to deepen even further. Tessie began to wonder whether she would even know if her mind were being worked over by a telempath. She shivered in the cold night air.

Footsteps. Maybe Randall couldn't get his car started. That's what took him so long. A figure entered the penumbra of the street lamp. Bulky, too thick at the waist for Randall. Just a stranger passing in the night.

Tessie stepped aside to let the figure pass. The figure altered course. Alarm bells rang. Then she saw the knife.

A part of her relaxed. She remembered her first karate instructor reciting her Litany of the Knife. It is the knife you don't see that kills. The knife you see is meant to intimidate. Be intimidated.

"Under the stairs, bitch." A gravelly voice, the voice of a bully. The dancing knife point indicated the murky recesses of a basement entrance shielded from the street lamp. Tessie knew that she didn't want to accompany this creep anywhere, particularly someplace darker than here. *Where the hell is Randall?*

Forget him. This was her problem now. She meditated further upon the Litany of the Knife. Give the knife what it wants, if you can. *Sorry, not this time.* If you fight the knife, expect to be cut. Take the cut on the feet or ankles so that you bleed to death more slowly. *Small consolation.*

The knife made another peremptory gesture and Tessie followed it swiftly. Her toe came up hard and caught the man square in the groin. His bleat was suitably anguished. For once, she got her toes right, but the blow still hurt through the soft leather shoes.

Now down and around with the toe. Watch the balance. The crescent kick caught his wrist a glancing blow, but it was enough to send the knife skittering. What was the last of the Litany? Get rid of the knife. *Done.* Hurt the knife—it meant to hurt you. *Good idea.*

She stepped in with a thrust punch to the solar plexus. Too much fat. This time she didn't pull the palm heel strike to the chin, at least not much. At the last instant, she opted not to kill him. His head snapped back and he dropped like a tranked buffalo.

Randall Santee pulled up to the curb in a late model Chrysler. "Sorry I took so long. I. . . ." His voice trailed off as he took in the dimly-lit scene. Tessie was sucking a bruised palm and hopping on one foot, her sore toe tucked behind her other knee. A

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beached whale burbled at her feet.

"I never saw Bruce Lee hop around like that." Again that surprising calm.

"Be grateful you didn't have to pay his liniment bill." Tessie hobbled around to the passenger side, climbed inside, and locked the door. "Scram."

"Shouldn't we call a cop or something?"

"And get arrested or sued? You want the publicity? Amscray."

"Sorry, I've never dated an assassin before."

"And you still haven't. For the last time, get us the hell out of here." They got the hell out of there.

Neither spoke until they closed the door on Tessie's hotel room. It wasn't much of a door—the minimum required by local fire laws. On the other side stretched a dimly-lit corridor. Beyond the jog at the far end dozed the acne-scarred night manager. If he noticed Tessie returning to her room with a gentleman in tow, he made a point of not noticing the fact.

Tessie sat on the bed. Randall commandeered the lone chair and placed it a prim two meters away from her. He sat and looked at her, waiting for her to speak. But Tessie was elsewhere. She was mostly through Stillness of the Body and just getting into Stillness of the Mind. She wanted to get past the adrenaline jag as quickly as possible. She needed to be relaxed so she could plan.

"Look, I really think we should move you to a better part of town." The words oozed through the healing murk and disturbed her inner calm. Tessie shook herself mentally, swam for the surface. All Randall saw was that she hesitated several seconds before replying.

"What makes you think that guy was the neighborhood reception committee? I believe you said something about a crazy telempath on the loose who's convinced I'm going to try to kill him. Isn't Arnie's specialty getting other people to do what he wants?" The anger still simmered there, despite Randall's explanation and plea.

"I can't believe...." Randall checked himself before completing the silliness. "OK, you're right. We don't know what he might attempt in his current state of mind." He paused. "Still, Arnie can only create mood. He couldn't force that thug to do his bidding."

Tessie fought down scorn, wrestled with exasperation. By the time she let herself speak, curiosity was in command.

"How do you know that? I mean, how do you know just what Arnie can and cannot do?"

"Well." Randall caught himself again. Thought for a while. "I've never seen him do anything except project emotion." Another pause. "And that's all he *says* he can do."

"What sort of experiments have you done with him?"

A long pause.

"None, really. He's just on hand for the business meetings." A lame addendum, "And I grew up with him. Kind of."

"Those business meetings. Is he in the same room as everybody?"

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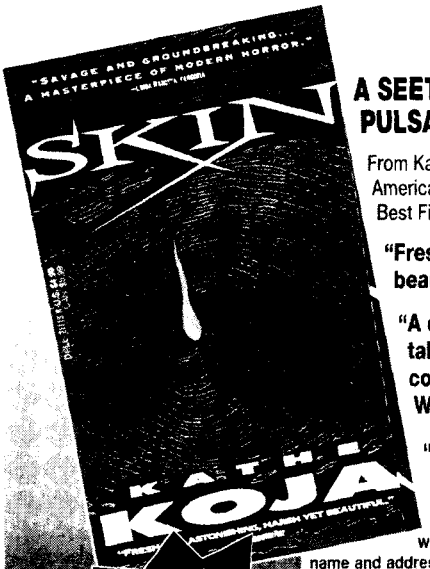

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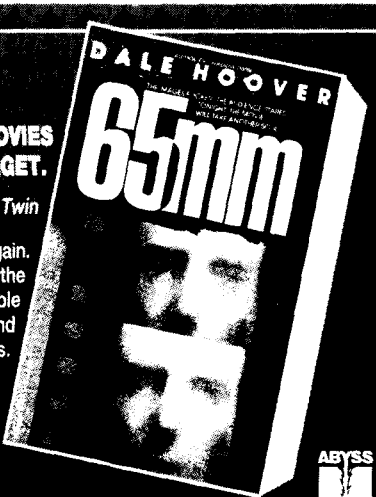

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"Of course not. I told you, Arnie's not very sociable."

"In the next room over?"

"Well, yes. He has to be."

"Are you sure? How do you know that?" All trace of gentle Virginia drawl was banished from that steely voice.

The bleak look was returning once again. Randall shrugged helplessly. Tessie knew she had to let up.

"OK, let's drop it for now." She was surprised by the softness in her voice. He looked so forlorn. Tessie stood up, reached for his hand. He clasped her small hand in both of his. Held on as if to save himself from drowning.

Was that maternal stirrings she felt, or something else? Tessie stuffed the thought and pulled Randall out of his chair. She sat him down beside her on the edge of the bed and wrapped her free arm about his shoulders.

"Now look, I know this is hard on you. But you really have to tell me all you can about your brother. What was he like as a kid? Did you play together much? How much time have you spent together as adults? What does it feel like when he's doing his thing? Don't try to organize your thoughts. Just let them come."

Randall began brokenly, but steadily warmed to his task. He talked of furtive meetings with his strange playmate, of the odd kinship they both sensed without words. The child in Randall woke up, then the awkward teenager, then the young man. Through it all ran his determination to love and care for his strangely blessed and cursed half brother.

Slowly, Tessie formed a picture of this bizarre double household ruled by a wildly energetic father. His arbitrary rule, the thrill of a dangerous secret shared with children—she knew those family dynamics well. Typically it was a drunken father and beaten children, or a stepfather and a sexually abused daughter. Where Tessie grew up, both aberrations were the rule more than the exception.

The analytical part of her mind ticked off an action item. Now she had an explanation for why Randall Santee had reached his early forties without ever taking a wife. He would be insecure for all his urbanity, afraid that he was somehow uniquely flawed. He would need a lot of understanding and loving care to mold into a happy husband and father. *Now cut that out.*

Somewhere along the way, she had begun rocking him gently in her arms. His head lay on her breast, an oversized schoolboy being comforted through his night fears. He cried softly. What was left of Tessie's analytical mind was in full retreat. She gave herself over to comforting this beautiful sad man.

Then they were kissing, first desperately through tears, then passionately. Tessie mourned his damaged childhood as she mourned her own. They were two forlorn teenagers convinced that the world had never seen such anguished mutual need.

Forgotten in the rush were all of Tessie's self-imposed rules. Don't screw the client, in any sense of the word. Guard your heart at all times like you guard your back. No sex

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Now they were two adults awash with lust. Buttons and zippers were no match for their determination to lock bodies. None of that adolescent fumbling for them. They were together, driving, laughing, gasping in mutual ecstasy. Tessie felt as if it would never end, feared it would end too soon.

The last waves of passion subsided. They drifted languorously, still intertwined. Flotsam and jetsam, they were one for a time.

Tessie slept.

A scritching noise intruded. She snuggled back into sleep. The scritching resumed.

A part of her mind awoke. It refused to go back to sleep. Tessie threw a mental pillow at it. It jabbed her in the ribs. She opened her eyes.

Randall was no longer in her arms. A dim memory reassured her that he had stumbled into the bathroom just moments ago. Back to sleep. *Bullshit.*

Scritch.

Adrenaline surged. Silence.

In simpler times, Tessie had once gone on a ski trip with a bunch of college friends. She drank late into the night, then set off for her hotel alone, through deep snow and sub zero chill. She fell and hit her head.

Whatever saved her that night was what she needed now. Somehow, she had to make frozen limbs respond to a torpid brain. Meters or miles, the distance was irrelevant. Lift a leg, put it down. Stay upright. Lift another leg. Put it down. Closer. Still impossibly far, but closer. She reached the door of the bathroom.

Randall lay in a heap between toilet and tub. He snored. A cheap afterthought shower loomed above the tub, its curtain rod forming a silly halo. Beyond the tub was a tiny window, the lone source of occasional daylight for this godforsaken hotel room. It looked out on a bleak alleyway.

The screen in the window skewed oddly into the room. It was half twisted free of the screws that deterred entry from the alleyway. A frozen shadow eclipsed the view. As Tessie watched, the shadow sprang to life and dropped from sight. She heard a thud punctuated by disturbed beer bottles. Then an asymmetric scuttle that faded rapidly down the alleyway.

She wanted to rush to the window to see the retreating form. But the languor persisted. By the time she could move freely, the scuttle had faded to silence.

Randall was breathing easily. A small gash on his forehead showed where he had hit his head as he fell to the floor. Tessie cleaned it with a damp washcloth, decided it needed no dressing. Probably no concussion.

She rocked him gently once again until he awoke. It took him several minutes to gather his faculties. Clearly, Randall was more powerfully affected by his brother than she had been. *And that was quite strongly enough, thank you.* This was going to be a four-door bitch of a job.

Tessie was all business now. Gently

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but firmly, she helped Randall into his clothes. She paid no heed to her own nudity in the process. Her bare skin still bore the sticky traces of their lovemaking. That annoyed her just enough to remind her what a fool she had been. She was grateful for the discomfort. It helped her keep her focus.

She instructed Randall to drive north for at least an hour. He could then find a motel and sleep for a few hours. She had to gamble that Arnie hadn't learned how to drive, that the trip would put Randall out of range of this strange and frightening talent. She could only hope that she could handle herself better without Randall around to attract and distract.

After she heard him drive off, Tessie set about blocking off the window for the night. At least it would slow Arnie down. If he chose to try again, that is. Tessie prayed that he would lay off for the rest of the night. She was drained, both physically and emotionally.

She allowed herself the luxury of a steaming hot shower. Her bag revealed an ancient cotton nightie, an old favorite that she normally left at home. Her mama had embroidered "TLC" in pink script over her heart. It was a gift for Tessie's fifteenth birthday. Now it was just a bit tight across the chest, but not uncomfortably so. Tessie welcomed the familiar texture.

She collapsed onto the bed, exhausted. Sleep came in fits and starts, bringing minimum rest with no relaxation. Repeatedly, she awoke with her mind in a spin. A shadow eluded her. A problem remained tantalizingly unsolvable. *Was that Arnie at work again?* Probably not, just exhaustion and fear.

Scritch.

Tessie was awake in a flash. *Oh God, no. Not again.* She lay immobile, her eyes open the merest slits.

The door began to open. A slash of light cut across the foot of the bed. Dim as it was, it practically dazzled her keyed-up senses. The door snubbed gently against the night chain. Silence.

The mistake that most people make when feigning sleep is to be too quiet about it. You don't have to snore —that's overacting. But you do have to make breathing noises. And you have to breathe more slowly than when awake. Tessie made the appropriate noises.

A shadow interrupted the slash of light. Whoever was at the door probably couldn't see much of the bed. Still, Tessie kept up the act. Seconds passed, a full minute. Then the shadow moved and the door swung slowly closed.

In a flash, Tessie rolled out of bed. She grabbed pillows, clothes from her travel bag. Rolled them up in the bedclothes to make a vaguely human shape. Then she was across the room and into the bathroom. Fortunately, that placed her behind the door to the room when it swung open.

Not a moment too soon. The door opened again, even more quietly than before. They must have held the latch so they wouldn't have to use the key a second time. So much for the security button on the inside doorknob.

A moment's listening pause. Then

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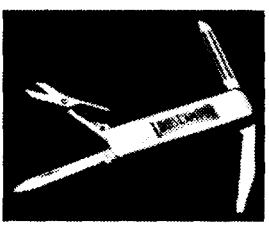

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a pair of metal jaws laced through the narrow opening and engulfed the night chain. Bolt cutters. Whoever was out there had come fully equipped for an unannounced visit.

Tessie chanced a peek while the cutters worked their way through the night chain. Through the narrow crack by the hinges she could see part of the hallway. A hulking form wrestled with the long handles of the bolt cutters. Looking over his shoulder was another man, gesturing silently but peremptorily. That one looked to be in charge.

So there were two of them. No, there was a third. She saw his shadow against the corridor wall. He was pacing about nervously. *How could Arnie have got these guys organized and moving so fast?* Tessie felt overwhelmed.

The chain gave with a gentle snik. Authority Figure was ready to catch the loose ends. Quietly, he lowered them one at a time. Slick work. The bolt cutters disappeared.

Tessie drew back into the bathroom. Forced herself to relax. The rush would come any moment now.

It came in a surprising form. The door swung wider and two men entered the room. One moved to the far corner of the bed, grabbed a handful of bed sheet. The second moved to the near corner, gun drawn. The third man stopped in the doorway. *What the hell?*

The guy with the bedsheet signaled thumbs up. He was Authority Figure. With a bold sweep, he yanked bed sheet and blankets free of the mass in the bed. A blinding flash. The jerk in the doorway was taking pictures!

Tessie went into high gear. She kicked the half-open door. Hard. Another blinding flash, this time at a crazy angle. A grunt of surprise and the camera hit the floor. Tessie shouldered the door closed. Was relieved to hear the latch snap into place. One less opponent for a few seconds. But there was still that gun.

The guys at the bed were starting to react. They had taken in the pillows and women's clothing on the bed before all hell broke loose. They knew by now that their surprise had backfired. Tessie hoped they were trained. Otherwise, she could expect random gunfire at any moment.

Her retinas still carried the memory of that first flash. She knew where the gunman was. Or had been a few seconds ago. *Hit him fast or slow?* Not an option. *Fast.*

She bowled into him in the dark. He was twice her fifty kilos, easily. But she had surprise and desperation on her side. She scrabbled for the gun hand, twisted the wrist savagely. Her other hand clawed at his face. Found eye sockets. Gouged.

The gun dropped. Tessie followed it down, pawed in the dark until she found it. On all fours, she scurried back to the door. Followed the jamb up with her free hand until she found the doorknob. Yanked it open.

Candid Camera was on his feet already but still looking dazed. He seemed to be unarmed. She pointed her new acquisition at his sternum and grabbed him by the belt buckle. The color drained from his face. She yanked hard and he stumbled into the

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room. Tessie hated divided targets.

She had ignored her other visitors altogether too long. Surprise has its limits. Tessie turned and flipped on the light switch. She was careful to squint as she did so.

It was an ugly light from the overhead fixture. But then, it illuminated an ugly scene. Authority Figure still stood in a swirl of bedclothes. Gunman was rubbing sore eyes and cursing softly under his breath. Candid Camera was trying very hard to control his sphincter.

Tessie stood before them in her little girl nightie. Her aureoles made two dark patches against the straining fabric. Naturally, her nipples chose that time to grow painfully erect. Cold air, shock reaction, and male stares sent overwhelming signals. She did not want to look sexy to these men at this time, but she knew that she did. *Damn.*

Time to change the dynamics.

"Hi guys," with hollow cheerfulness. "Why don't you drop your pants for me? Then you can put your hands on top of your heads." She made a reckless gesture with the gun.

"You're making a serious mistake, Miss." Authority Figure. "We're police." He reached for an inside jacket pocket.

Tessie steadied the gun, braced it expertly. The shot would pass through pocket, hand, and heart and they both knew it. He froze.

"You're dead men if you don't do what I say. Now!" The authoritative bark got them moving. Three pairs of hands went to work on belt buckles. Trousers slid to the floor.

"The underpants too." A mixture of shock and anger. The gun waved. They moved. "Don't bother to kick them off. They look better around your ankles."

The maneuver had the desired effect on them. She could feel her nipples relaxing as well.

"Now, can we all make cat's cradles?" Tucking the gun under her arm with obviously feigned casualness, she interlaced her fingers and smiled brightly. With camp counselor gusto, "See, isn't that easy? Now *you* do it." They did it.

"Now, hands on top of your head. Keep those fingers tight, guys. Good. As long as you stay that way, I won't be nervous. And you know how I get when I'm nervous."

Gun still under her arm, Tessie made a stewardess dip to pick up the camera. It looked to be intact despite its fall. Two FujiPrints lay scattered on the floor. One showed pillows and swirling bedclothes, the other a large expanse of ceiling.

Tessie whirled and snapped three quick pictures. She caught Candid Camera in mid-protest. Then she snapped the corridor—abandoned bolt cutters and all. She finished the mini documentary with two shots of the severed night chain.

The prints looked good. She tossed the camera on the bed, lobbed the prints into her bag, and regained proper control of the gun.

"OK, assholes. Now you can talk. You!" Authority Figure again. "What's your name?"

"I told you, we're police. If you'd just let me...." His right arm

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twitched with desire. But his hands stayed properly linked.

"Maybe later. I didn't ask *what* you are. I asked *who* you are. Your name, asshole."

Anger flared in his eyes. Subsided. He knew he was outclassed.

"Heatherington. Detective Joseph Heatherington. Fifth Precinct."

A glance at the gunman elicited a reluctant, "Detective Ron Schwartz. Same." From Candid Camera. "Tom Przbycki. Same." His voice was barely audible.

"The Fifth Precinct is across town. What are you doing making house calls here?"

Heatherington was obviously shocked at her detailed knowledge of the city. She was beginning to wear him down. Good.

"We got wind that you . . . that an assassin was coming to town. This city takes a dim view of cold-blooded killers."

"But you're all in favor of breaking into hotel rooms in the middle of the night?"

"You're a dangerous person." His eyes rested on the gun by way of supporting evidence.

"I'm a law-abiding citizen. I was once fined for drinking underage in Lauderdale, along with three thousand other kids. I have two speeding tickets. All misdemeanors for which I've paid my fines. How clean do you have to be to get a good night's sleep in this town?"

"You're a killer." Flatly.

"So are you." A calculated guess.

"Only when I have to be. And always within the law."

"Me too."

This was going nowhere. She gestured at Przbycki.

"Why the film crew? Are there auditions that somebody forgot to tell me about?"

He squirmed. Started to say something, caught himself. Tessie knew that the next thing Heatherington said would be a lie. He would come no closer to the truth than he must to be convincing.

"We figured you wouldn't like to be caught with your pa—" He looked down for the briefest instant. "You wouldn't like to be caught helpless in bed. Bad for your professional reputation. We were going to . . . encourage you to leave town rather than get the bad publicity."

"I get it. Forcible entry, invasion of privacy, and blackmail. Plus a few pictures of my bare ass to decorate the station house? You're my kind of cops."

What else were they after? Did they know about Randall? *That was it.* The night manager must have tipped them to his presence. Missed his exit. Tessie wasn't the blackmail target. He was.

Now what? She couldn't sustain this little drama much longer. How to resolve it? Slowly, a nasty plan dawned.

"OK, let's say you're cops." She warded off their protests with a gesture. "You'll get to prove that in just a few minutes. Here's the deal. You produce proper badges and I'll let you walk out of here alive. Well, shuffle out anyway." Another disdaining glance at their nakedness.

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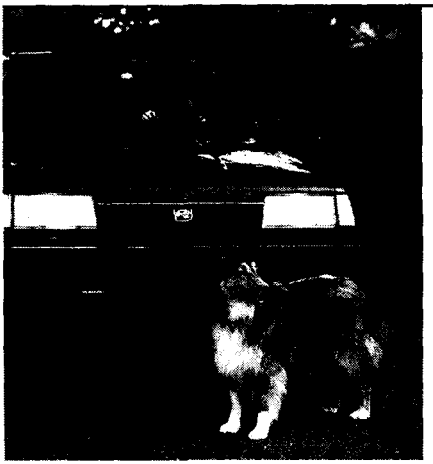

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"Of course, I get to keep your gun and badges." Another wave of protest, quickly hushed.

"I intend to check out of this charming hostel at eight o'clock. That's," she looked at her watch, "four and a half hours from now." Was it really 3:30? Her time sense was shattered by the events of the night.

"If I am left *completely alone* until then, you'll get your toys back." She jerked her head toward the corridor. "I'll leave them with your good buddy at the desk."

She paused for menacing effect.

"You'd better pray that nobody disturbs me until then. Otherwise, I'll deliver gun, badges, and *photographs* to the city editor at the *Tribune*. Your boss can explain to the press how three of the city's finest were overwhelmed by a half-naked girl asleep in her bed."

They got the picture. She was careful to name the paper that specialized in exposés of police corruption and misconduct. Two could play at the blackmail game.

The rest was anticlimatic. Tessie relieved them of their badges with an insulting lack of caution. True to her word, she made them shuffle ignominiously out of the room. She closed the door and braced the chair firmly against the doorknob.

Only then did she let herself start shaking.

Randall pulled up to the curb promptly at eight. Tessie was more than ready to go. She wore her Board Meeting tan suit with matching doeskin pumps and purse. She also wore her Efficient Businesswoman face, despite a scant two hours sleep.

She scooped up a small bundle wrapped in a hotel towel, and dropped it primly in front of the desk clerk. He didn't touch it, didn't meet her eye. He could have been a cousin to the night manager.

"That's for your coworker. He'll know what to do with it." She placed her room key atop the bundle, like adding a cherry to an ice cream sundae. "And you know what you can do with this, too." She smiled sweetly, grabbed her bag, and walked out of the Statesman Hotel for the last time.

She opened the passenger door and tossed her bag in the back seat. A parked car across the street caught her eye. A nonde script late-model Mitsubishi. Two men inside. Heatherington at the wheel, and Schwartz, minus Przbycki. She waved to the men cheerfully. They tried not to notice.

The desk clerk came out of the Statesman carrying Tessie's bundle as if it were a particularly dirty diaper. He gave Randall's car a wide berth, ran across the street. Handed the bundle to the waiting men. The car started. Edged away from the curb. Waited.

Tessie shrugged, climbed in the car, and pulled the door closed. Randall was wearing the same suit as the night before, but had come up with a fresh shirt and tie. He looked functional, if a bit bleary eyed.

"Friends of yours?"

"Police escort."

His eyebrows went up. Tessie described as briefly as possible her interview with Heatherington and

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friends.

Randall furrowed his brow. "Arnie again?"

"I thought so at first, but I don't see how." Tessie considered. "I think the cops found out I was coming, probably through some leak at Santee Castings. It's not the first time I've been hassled by the local constabulary."

Randall looked exasperated. "And I thought we were security conscious. First Arnie finds out about you, now the police. You must think we're a real bunch of klutzes."

Tactfully, "I think that assassination is serious business. Fortunately, most people are amateurs at that game. Otherwise, the world would be even uglier than it already is."

Randall pulled away from the curb, turned onto a major cross-town street, picked up speed. Tessie watched in the side-view mirror as their police escort ran a red light to stay up with them.

Eventually, "Look, about last night. . . ."

Tessie stifled an insane giggle. How many morning-after conversations throughout history had begun with those words? Time to be sober. She knew the words that needed saying.

"Don't worry. I understand that you were . . . influenced last night. I have no illusions about your intentions. You are under no obligation to me. I'm sorry if what happened has caused you any distress." Stoically she added, "And as far as I know, I'm disease free."

Long silence. They came to a turnoff, took it. The cops followed.

"Actually, I was going to say something else." He risked a sidelong glance despite the morning traffic. "I was going to say that what I felt for you last night was genuine. Whatever Arnie may have brought to the party, there was something real there too. I don't want that to get lost."

Damn. Of all the things he could have said, that pronouncement complicated her life the most. Another giggle threatened to bubble up. This time it was the gleeful little girl. *Stop it*, she told the child within. She fought to maintain her icy stoicism.

"I appreciate the sentiment, but it's not something I can deal with right now. Let's defer this discussion until after . . . until sometime later on." God, it was tough being a woman sometimes. Part of her wanted to be warm and had to be cold. Another part wanted to be cold and had to be warm. She must sound completely artificial.

But Randall smiled his boyish smile then said, "Thanks," with apparent sincerity. His hand brushed her knee with just a hint of intimacy. Somehow, she'd gotten it right. She relaxed half a notch.

Randall gestured past the approaching intersection. "There's Santee Castings. The back end, at least. We have to go around to the front."

Tessie saw the tall cast-iron fence and the woods beyond. She knew from her background check that the lot was a full kilometer on a side. But she didn't realize how *big* that really was until she saw the fence disappearing into the distance. Inside was mostly woods and gentle hills at this end. Occasionally, she caught a

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glimpse of the Mansion House on the highest hill. She tried to make it dark and foreboding, but it wouldn't transmute. It was an Edwardian gem, a holdover from a simpler and more honorable time.

Suddenly she realized that their time alone was almost at an end. Heatherington and Schwartz had pulled closer on their tail. She still had much to go over with Randall. She opened her mouth to speak, then shut it. A pale salmon-colored blob appeared briefly between two trees behind the fence, hardly more than a shadow within a shadow. But Tessie knew that color. It was one of her favorite uniforms. At least when she and the wearers were on the same side.

"You've hired Pinkertons?"

"Why, yes. How did you know?"

"What branch? And how many?" She ignored his counter question. Randall blinked at the sudden bark in her voice.

"Um, let me think. Edwards hired them, our CFO. I know they're home office guys, Osaka, I think. At least two dozen." Then, "Bloody expensive."

That would make them Asahi Pinkertons. Good. All academy trained. And a team that size would have to have a lieutenant. He would be neo-samurai. He'd have to be. For the first time in many hours, Tessie started to feel infinitesimally better.

"Fine. You'll have to arrange a meeting between me and their top guy. Right after the board meeting if at all possible."

Randall turned the corner, started down the second long side of the huge square that was Santee Castings. Ahead, Tessie began to make out the industrial complex that sprawled over a third of the grounds. Randall was slow to answer.

Flustered, "That's something I've been meaning to tell you. You'll meet Shimizu-san, all right. He insists on personally screening everybody who enters the executive offices. Particularly people with your, uh, credentials." Pause. "And I'm afraid he and his men do body searches." Another pause. "Believe me, it's been hard to convince the women employees of the necessity."

Tessie snorted. "I've been through worse."

"Uh, there's another thing. I won't be going to the board meeting with you."

With barely a moment's thought, Tessie swung her leg across the console that separated the two front seats. Brought her doeskin pump down hard on the brake pedal. Randall swerved the car in surprise. She could hear a cascade of squealing tires and blaring horns behind him. Got a satisfying glimpse of Heatherington's face muddled with astonishment and anger.

Randall worked the car to the curb, put it in park. The cops followed suit. Slowly, the traffic sorted itself out and pulled past. Tessie ignored the mixture of hand gestures offered by the shaken drivers.

"Would you like to elaborate on that last statement?" She was beyond the poisoned sweetness of the Southern belle, beyond sarcasm. A

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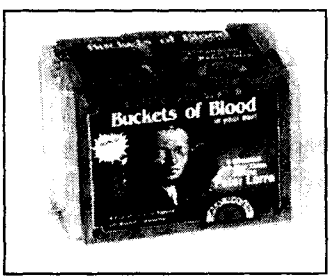

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throbbing pain started up behind her left eye, small but growing.

"I phoned Edwards last night, after I left you. Told him what happened to you at the Holiday Inn." He darted an uncomfortable glance her way. "And what happened to both of us at the Statesman."

Deep breath. "He's decided to tighten security even more. And he's worried about how the other board members might view my objectivity if they find out about . . . us." Then hastily, "I know you require a unanimous board resolution before you'll take on an assignment. I assure you that I will join the board in whatever they decide. It's just that," another uncomfortable glance, "Edwards is afraid that my presence might interfere with negotiations."

"Negotiations? What negotiations? I made my terms clear enough before I came here." The throbbing pain flexed its muscles. Just once, she would appreciate clients who didn't insist on haggling. A four-door bitch of a job, indeed.

Tessie again weighed the alternatives. If ever there was an assignment she should walk away from, this was it. And here was her last real chance to walk away, before she made the irrevocable commitment. And got herself killed, likely enough. But she also needed the money badly. And she didn't dare tarnish the gilt-edged credentials that let her charge top dollar. She was the assassin who always came through, who never walked away no matter how difficult the case. Or the clients.

She hesitated a moment more, then capitulated. She knew that she had already committed herself to helping Randall Santee. It wasn't about money, or starry-eyed dreams, or even (*God help us all*) love. It was, oh hell, she didn't know what it was about. But it was a commitment, none the less.

Resignedly, she said, "Let's get going. We're going to be late." The little girl inside whimpered in fear. Tessie was too tired to comfort her. Her head throbbed.

Randall studied her a long moment. Whatever emotions warred inside him, he could turn none of them into words. Finally, he put the car in gear and eased back into traffic. Heatherington followed, at a more respectful distance this time.

Then, just when Tessie thought the moment had passed, he said, low and soft, "Thank you." Another long pause. "And, for what it's worth, I'm disease free too." That ridiculous boyish grin again. *Damn the man.*

They turned another corner and there was the entrance to Santee Castings. Their dedicated shadow finally left them and parked behind a marked police car near the gates. A line of cars moved slowly past a Pinkerton checkpoint to enter the employee parking lot. It snuggled up against a corporate-modern structure that reeked of executive power.

The most desirable spot had his name on it, naturally enough. They left the car there. Her bag would be safe enough in the back seat, with all that security around. They went up the short walk to the main entrance. An otherwise upscale reception area

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had been turned into a personnel checkpoint. Now it looked more like an airport departure gate. Only it was manned by Pinkertons, who play for keeps.

"There's Edwards." Santee returned the wave of a handsome, graying executive type. He stood in a small clutch of staffers, on God's side of the checkpoint. Apparently, Edwards and company had been awaiting their arrival for some time.

"Here, let me run the gauntlet first." Santee stepped forward to the table blocking the entrance. He proceeded to empty his pockets onto a tray. Coins clattered. A Pinkerton quickly sprang forward and greeted the head of the company with all the deference he commanded, and then some. This despite the fact that said head of the company was about to suffer a humiliating pat down in front of witnesses. More likely because of that very fact. Tessie understood the peculiarly Japanese dichotomy of the moment. The guards would be all the more deferential because they had to compromise the stature of someone in authority.

Tessie studied the man who in turn was studying the contents of Santee's pockets. That would be Shimizu, the lieutenant in charge. He was tall for a Japanese. Early thirties. Ramrod discipline, but with eyes that saw, understood, and forgave much. Definitely neo-samurai. The marks of rank were small, in the manner of the Asahi Pinkertons. The marks of his special status were nonexistent. But to the trained eye, he was clearly a member of the new elite.

Santee stepped through the metal detector at the end of the table. He opened his arms and stood feet apart, submitting graciously to a thorough body search. Nothing would get past Shimizu that could be used as a weapon. Tessie was counting on that.

Shimizu bowed again. A subordinate hurried to offer Santee's tray of personal items to him, waiting patiently as Santee refilled his pockets. Santee joined the clutch of waiting civilians. All eyes were now on Tessie.

It was her turn. She knew what was coming. Or at least she hoped that Shimizu would see the obvious. Forgotten for the moment was the nagging pain behind her left eye. Forgotten were the uncomprehending clients she would soon have to haggle with. No time for that now.

Tessie advanced to the table, bowed a neutral greeting to Shimizu. Deftly, he matched her neutrality to the millimeter. She laid her doeskin purse on the empty tray, directing his glance downward with the gesture. She composed herself. Stared evenly at the top of his head.

He spilled the contents of her purse onto the tray. Poked among the litter gingerly with an extended forefinger. Maybe he thought something would bite. Or perhaps he wanted to show that he intended to palm nothing from that pile of private goods. Or insinuate nothing into it. She watched as he studied, arranged, and rearranged the scant collection. Tessie traveled light.

Three items stood out in matching tortoiseshell. He grouped them

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slowly. They looked innocent enough. A circular compact that opened to reveal a mirror and a delicate blush. A rat-tail comb with a sturdy handle. A small brush with an unusually flat head that tapered to an acute wedge. One by one, he picked up each item, hefted it. He grasped each one in the approved fashion for the quick kill. The Disk, the Point, and the Edge. He knew.

Slowly, he raised his head. He took in Tessie's relaxed but ready stance, saw Stillness of the Body. He returned her steady gaze, saw Stillness of the Mind. He knew, indeed. But years of discipline held him in check. He simply bowed. Deeply.

Discipline was not so well ingrained among the rank and file. Tessie heard several Pinkertons suck wind through clenched teeth. (That would cost a few punishment details at the next review.) Out of the corners of her vision, she watched the other guards play follow the leader. Only they bowed even deeper.

Thank God this guy's observant, Tessie thought as she returned the bow with proper measure. *At least they're competent, and they recognize my credentials.*

Credentials, indeed. What they knew of her was half secret religion, half modern myth. Tessie was neo-samurai, just like their boss. That made her special enough. But she was also far more than that. She was a member of an even more elite group. A group that was not a group—like a clowder of cats. A group so small and so secret that even the academy trainers spoke of it in apocryphal tones. And then only at night, out in the field after maneuvers, away from the ears of pudgy bureaucrats. They spoke of it only when the lonely night wind rose and talk turned to matters of honor, and pride, and of hopes for the future. Only then did they speak of such as she.

She was a child of the avenging kamikaze and the almighty tai-fun (said the trainers), those most murderous of storms. Holy offspring of an unholy alliance. Born of desperation and determination. Schooled in vengeance and destruction. Unstoppable even in death. She was a Daughter of the Winds.

And the truly awesome part, these Asahi Pinkertons knew, was that she was still Tessie Luellen Crocker, a simple country girl. None of the myths ascribed to her any superhuman powers. Just as well, she didn't have any. Nor did they credit her with an excess of courage or intelligence. She made no claims there, either.

What the myths did promise was loyalty. A Daughter of the Winds never sold out a client, never reneged on an oath. Never. And the myths promised, above all, a determination that transcends fanaticism. Once a Daughter of the Winds started down a path, there was no deflecting her. You could break her legs and slow her down, maybe. But you'd never sleep safely again if you did. And you'd be wasting your time if you tried to kill her. Even if you managed to succeed, she'd still achieve her original goal. And wreak vengeance upon you in the bargain. God knows

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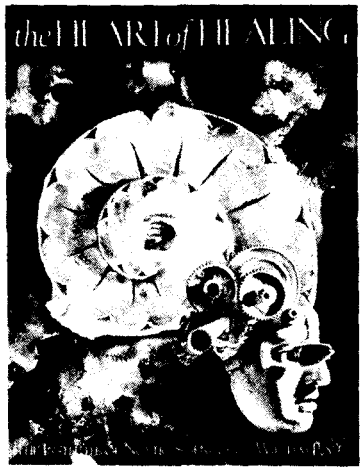

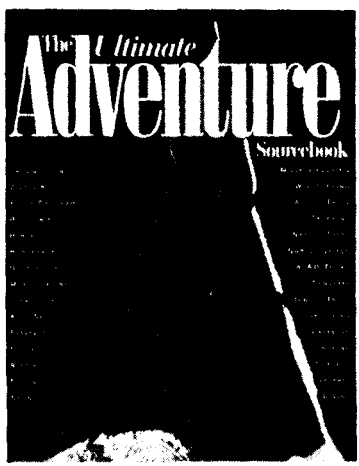

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how, but she always did. Always.

The Winds never cease their blowing.

Tessie held the bow as long as possible. As long as necessary for the implications to sink in. These guards would have to contend with her, whatever else their mission. Now it was time to seal the bargain. She ended the obeisance, came to full attention.

In her best Japanese, Tessie said, slowly and distinctly, "I thank you my brothers for the care you have shown our clients." More sucking of wind. *That did it.* She had them in her pocket now.

She could have just said "my brother," singular. Shimizu was neo-samurai and close enough to being her peer. He would be honored by the elevation, and the rest would accept the glory by association. Instead, she had subsumed them all, counted them as her equals in this matter. And then she spoke of "our clients," lest there be any doubt. They were on the same side. A potentially implacable foe had become in an instant the most valued of allies.

From that moment onward, any of the Asahi Pinkertons would have died fighting alongside her. They would trust her commands, even if they appeared to contradict the wishes of the clients. She was, after all, more dedicated to their clients' survival than the clients were themselves. Yes, Tessie had acquired a small army of allies with just a few words and gestures. And one small implied promise.

The Pinkertons knew that she too would die helping them do their jobs.

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I hope the bargain isn't too one sided. For any of us.

Shimizu had finally digested the implications. He came to attention too, gave the requisite small bow of introduction.

"I am Tetsuo Shimizu, Lieutenant of Asahi Pinkertons. We welcome you . . . Tessie-san." No Japanese would have addressed another formally by first name in that context. Tessie understood that she was a special case. She took it for the honor that it was. She returned the brief bow.

Shimizu gathered the contents of her purse, handling each item with more care even than before. He clasped the purse, balanced it on fingertips. Like a Ginza shopgirl tendering up a neatly wrapped purchase, he returned the doeskin purse to Tessie. With that, he bowed again and motioned her past the security checkpoint. There would be no humiliating pat-down.

Tessie became aware of her audience. They had stood quietly while the small drama unfolded. Now they looked puzzled, to a person. Tessie's security check had certainly not gone according to the plot. It was not clear, in fact, just how it *had* gone.

Santee stepped forward, gesturing to the man at his side. "Tessie, I'd like you to meet Giles Edwards, our CFO. Giles, Ms. Tessie Crocker." Edwards shook her hand, but barely met her eye. He had other things on his mind.

"Shimizu-san. Why did you not check this person properly?"

Shimizu was unfazed. "Not necessary," he barked. He made no attempt

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to explain the futility of trying to deflect a Daughter of the Winds, whether she was acting as friend or foe. Besides, it was none of their goddamned business.

Edwards should have gotten the message, but he didn't. He plowed onward.

"Our policy is to body search everyone, employees and visitors alike. You know that. You helped establish the procedures yourself."

"Not necessary." The tone was no louder, but it radiated that very Japanese don't-screw-around-with-me attitude cultivated by people in authority. Even Edwards began to realize that he would get nowhere on this topic. He wrapped himself in officiousness.

"Very well. But you can be sure that your superiors will get a detailed report of this incident." Shimizu bowed as politely as necessary, more stonefaced than ever. He turned and left the room with most of his crew.

Santee gestured the others through a mahogany door. He lingered behind with Tessie.

"What was that all about? Are you a Pinkerton in disguise, or are you blackmailing them? I've never seen such a quick change of attitude on the part of Japanese."

"They know a thing about me." She hesitated, not knowing how to proceed. "It's a thing they've learned to respect."

"Oh, I see," clearly not seeing. "Should they? Respect this thing, I mean." She stared up at him with a dead neutral gaze. "Sorry. Stupid question."

They followed the others through the door.

Santee led Tessie into the plush recesses of the executive suite. It was a land of heavy drapes, thick carpets, and sturdy rosewood furniture. The smell of old money was everywhere. *And the stink of fear,* Tessie thought to herself. A little too much bustle. Voices a little sharper than normal. A little too much emphasis on the appearance of quiet competence. It was a familiar scene to Tessie. She was seldom invited into a corporate board room until the fear there became too palpable to hide any more.

She tried to take some solace in the familiarity, edgy as it was. *It's kind of like seeing the knife,* she told herself. *You can relax a bit once the danger is known.* But that was just whistling in the dark. Normally, at this stage, she was rested and alert. Now she felt like she'd been pistol whipped. And normally, at this stage, she held a trump card or two. Now she was fresh out of aces. *Or jacks, for that matter.* Exhaustion and fear chewed at her vitals.

Worst of all was the realization that struck her every time she approached a board room. She was about to undertake the most dangerous part of an assignment.

God, I wish I was a bored housewife.

At Santee's gesture, a matronly woman approached. "Tessie Crocker, Edith Wilson. Edith makes everything happen here." The woman smiled warmly and shook Tessie's hand like an equal. Tessie knew that Santee

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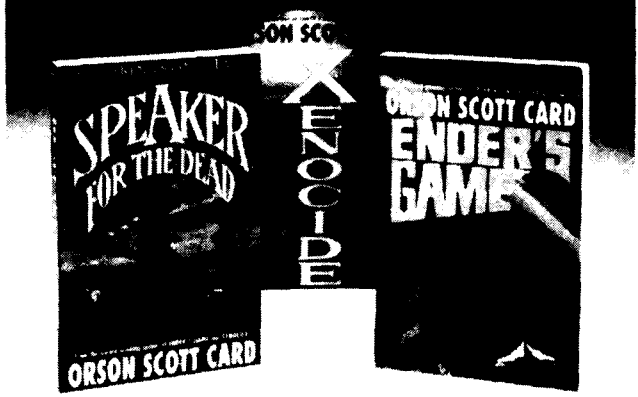

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spoke the simple truth. Every office needs an Edith Wilson or nothing ever quite gets completed.

"Welcome to Santee Castings, Ms. Crocker. Call me Edith. Can I get you a cup of coffee?"

The question shocked Tessie. She realized that she had eaten nothing since the truncated dinner of the night before. So long ago. She was famished. No wonder she was drowning in despair. Her blood sugar must be nonexistent.

Some part of her mental process must have shown on Tessie's face. Or she was simply too haggard to masquerade as Efficient Businesswoman. Edith gave her a sympathetic once-over and clucked.

"Randy, I know you don't have enough sense to eat a decent breakfast. But you can show a little courtesy to your guests. Come along, dear." Edith set sail for a nearby doorway. That Tessie would follow and be subject to her ministrations was not a topic for discussion.

Santee and Tessie shared an understanding grin. "Well," he said, "I guess I'll see you later. Between Edith and Giles, I guess you'll be looked after." He dithered a moment, decided not to touch her, and retreated awkwardly through the doorway they had first entered. Tessie sighed inwardly, turned to follow her mother hen.

Giles Edwards reappeared, surrounded by his customary sea of retainers. Tessie watched in amusement as Edith parted the waters on pure strength of character. Even Edwards stepped aside for her. But he was not completely overawed.

"Edith, please show Ms. Crocker into the board room. We're supposed to begin in five minutes." Tessie's heart sank. She was looking forward to a brief respite under the tender care of Edith Wilson. But she need not have worried.

"Hmph. A board meeting hasn't started on time in all the years I've worked here, Giles. Ms. Crocker needs some time to get ready. You can tell the others that the meeting will start in forty minutes." With that, she exited stage right. Tessie shrugged a what-can-you-do to Edwards and followed.

It was a cozy little meeting room that obviously did double duty as an executive dining room. Edith pointed to a discreet door in one corner.

"You can freshen up in there, dear. We girls keep our pills on the top shelf of the medicine cabinet. Help yourself to your favorite poison. I'll go stir up some field rations for you." And she was gone.

Tessie found a well appointed bathroom, complete with shower and marble tub. Downright sybaritic for the likes of Santee Castings. The medicine cabinet revealed a host of disposable razors and toothbrushes, plus the advertised stash of drugs. Considerate. It was also gracious of Edith to introduce that hint of ambiguity. Tessie wasn't necessarily exhausted, it could be just a bad time of the month for her.

She picked a strong painkiller that wouldn't muddle her thinking excessively. Washed her face with cold wa-

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ter, dried it in a cloud of terry cloth. Combed her hair. Much better. Her eyes were a bit bloodshot and her nerves still a big jangly. But she definitely felt much better.

Edith Wilson's idea of field rations was well above the survival level. Poached eggs on sourdough toast, fresh orange juice, and strong black tea. All laid out on Wedgewood, sterling silver, and Irish linen. Tessie ate slowly and deliberately, savoring every bite. She also savored the delicious privacy that Edith insightfully granted her. A part of her wanted this interlude to last forever.

But that, of course, was not to be. Edith reappeared just as Tessie was pouring her last cup of tea. She carried a cup of her own, sat down across from Tessie. The older woman had that miraculous ability to shift smoothly from taskmaster to subordinate to peer. Tessie admired her skill.

"Feel better, dear? Good. You looked like you could use a break before the board started hammering on you."

"Yes, thank you very much. You've been very kind. I couldn't have held up much longer."

Another cluck. "Those men. When they were boys, I spanked both Randy and Giles on more than one occasion. They were both brats. Now they're too old for it. But they still need a good spanking from time to time."

"So Giles grew up with Randall?" That was a revelation.

"Oh yes, they're cousins. Their mothers were sisters. Poor dears." Tessie knew that Randall's mother had died at her own hand when he was young. What could have happened to her sister to earn Edith's sympathy? Tessie was curious. But now was not the time to pursue *that* topic. There was a more important matter at hand.

"Then you knew Arnie, too?"

Edith went deadpan. *Damn.* Tessie kicked herself for pushing too hard. She hadn't intended to hurt this kind woman, but evidently she had. She was still groping for some way to make amends when Edith spoke again. Her voice was tight, controlled. But there was no anger there.

"Yes, I know Arnie." Tessie caught the change of tense from *knew* to *know*. "If only a simple spanking could get the brat out of every boy." She stared down at her hands, now mottled with age. Looked up at Tessie.

"I know why you're here, child. Though God knows we were expecting a different sort of someone." A brief laugh. "A grizzled old pirate with a scar on his cheek, I suppose." She took a deep breath, let it out slowly.

"It's a hard world out there. I know you'll do what you have to do. We all do." She brushed away a stray tear. Shook herself. The moment had passed.

"Well, I'd better get you to the board room." She was the deferential assistant once again. "Now don't you let Giles push you around too much. He likes to bluster, but mostly he's just a playground bully. To tell you the truth, he's more nervous than any of the rest of us. He spent half of yesterday afternoon rearranging chairs

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in the board room." A snort. "Imagine, Giles Edwards fussing around like a wedding director."

They both stood up. Tessie grabbed the woman's hand before she could bustle out of the room. Because she was neo-samurai, Tessie said nothing of the thoughts and emotions that churned within. But because she was still a country girl, she hugged her new-found friend.

The board room was nearly full, yet stone silent. A great slab of a rosewood table down the middle, sturdy chairs widely spaced along the sides. Sturdy people filled the chairs, their faces devoid of emotion. Giles Edwards sat at the head of the table, a half smile of anticipation playing tag with a nervous tic.

Two empty chairs remained, both delicate Queen Annes. One stood before an antique secretary to one side of the room. That was obviously the domain of Edith Wilson. The other stood at the foot of the long rosewood slab. It was equally obvious who was in the hot seat at this meeting. *Bloody nuisance.*

Tessie heard the barest hint of indrawn breath. Turned to catch Edith with lips pressed in anger. Then her face glazed over like all the others. She may have been a friend five minutes ago, but in this room she was a company loyalist. No point in looking for more help there.

What the hell did she see? Tessie scanned the room again, looking for clues. Then realization dawned. She counted heads quickly. Counted them again. *Damn.* Six missing. No wonder the chairs were spaced so far apart. A four-door bitch of a job, indeed.

"Come in, Ms. Crocker. We've been waiting for you." Edwards was playing the booming host, but his voice wasn't fully up to the job. "Take a seat, please, so we can get going." The least hint of impatience. He did not stand up in welcome. Nor did anybody else.

Tessie walked to her appointed place but didn't sit down. Instead, she placed her doeskin purse on the table, unclasped it, and removed a small notebook. Deliberately, she opened it. Thumbed slowly through it until she found what she was looking for.

"Thank you. But first we need to call the roll." She swept the table in a measured arc. "As you may recall from my written proposal, I can only do business with a complete board of directors that can pass unanimous resolutions. I understand that Mr. Santee must be absent from the initial part of these proceedings. That is acceptable to me. I cannot, however, begin discussions until everybody else is present."

She swept the table again, trying to look twenty years older than she was. Several people avoided her gaze, squirmed uncomfortably. *Good.* Now to let them off the hook.

"Mr. Edwards, I apologize for being late. I took advantage of the good graces of your able Ms. Wilson. Now I know I've made you all wait, and you're understandably put out." A cheery smile. "So why don't we all stretch for a few minutes? I'll grab a quick breath of fresh air and you can rearrange the seating to make your-

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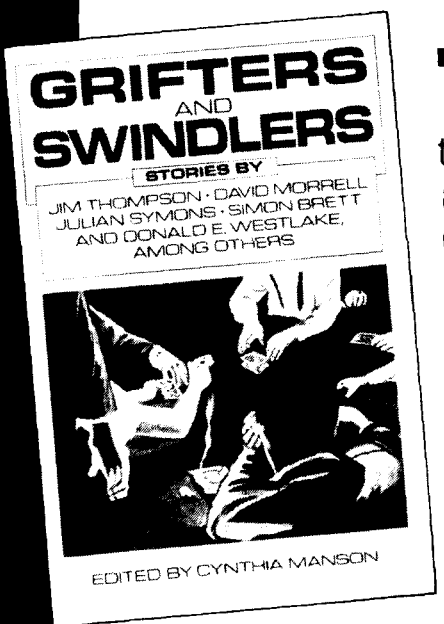

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selves more comfortable. I, for one, would love to try one of those other chairs. Do you think you could bring one in for me?"

Edwards knew he was outmaneuvered. Decided to take the face-saving out.

"An excellent idea. Folks, let's take a ten-minute break. Edith, please show Ms. Crocker to the courtyard."

Tessie once again found herself trailing after Edith Wilson. They passed through an outside door into sunlight and the splash of waters. The courtyard proved to be a delightful little garden, not quite Japanese and not quite English. It had clearly benefited from many years of loving attention.

"It's wonderful."

"Yes. Randy's dad laid it out when he first took over the company. We consider it a major employee benefit."

Another dizzying revelation. Was this the same man who couldn't stay in school, who could never be content with a single woman? *People are never simple.*

"Dimitrios Santee was many things in life. Few people understood that he was a poet at heart." For a wild moment, Tessie wondered whether telepathy was another of Edith's talents. Then she realized that the woman was simply intelligent and insightful. *Simply. Hah.*

"I was just thinking how people are seldom as simple as they appear to most other people."

"Yes. I was thinking the same thing about you." A warm but appraising glance. "You handled that well in there. I can see that it must be a common problem in your line of work."

Tessie nodded. "It's one thing for a company to commit to hiring an assassin. It's quite another for a company director to personally endorse the intended act. But it's very necessary."

She looked at her watch. "The next ploy that some directors try is to send in substitutes. You might pass the word that I have pictures as well as names of the entire board. It can save us another delay." A significant glance. "It can also save face for a few people. I can't handle a trick like that with the same grace as the last one."

Grim smile. "A good point. I'd better go help with the chairs." Tessie took that for the implicit promise it was. There would be no more fun and games. Edith would see to it.

She was alone again, but not for long. Giles Edwards came through the door, then directly to the point.

"We seem to have gotten off on a bad foot, Ms. Crocker." A nervous grin. "That sounds so formal. Do you mind if I call you Tessie? I'm Giles." Tessie gave a neutral shrug. "Fine." Another weak attempt at a hearty boom.

"I'd like to start over with you, if I can. We're all pretty nervous, as you can imagine." Sad shake of the head. "A bad business, this." An attempt at a sympathetic smile. "And I know you've had a poor reception, so far. Randy told me about your three visitations last night."

An executive smile. "You must feel like Ebeneezer Scrooge on Christmas morning."

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Tessie stared at him levelly. She didn't like Giles Edwards, for obvious enough reasons. He was sneaky and insincere, and terrible at hiding both flaws. He must be very insecure in some fundamental ways, for all his apparent stature within Santee Castings. It was interesting that Randall seemed to trust him. And Edith could see him as no more than a naughty boy. But Tessie's dislike ran deeper than that. She had better figure out why.

No time for that now, however. Like it or not, she had to do business with Santee Castings. Absent Randall Santee, Giles Edwards was the principal decision maker. She had better find a way to work with him.

"OK, Giles, let's try again. But I remind you that you're all amateurs in a very dangerous business. The written terms I sent you leave little room for error. If you insist on mucking with them too much, I'll have to walk away."

A broad executive smile. "Oh, I'm sure we can come to terms." He placed his hand on the small of her back, as if to sweep her back into the board room. Tessie toyed with the notion of breaking a finger or two on that hand. Decided against it. He had clearly taken her warning as just a bargaining ploy. *Idiot.*

This time the room was more fully occupied. Tessie still had the hot seat at the foot of the table. That was to be expected. But now, at least, it was a duplicate of the other chairs around the table. She had driven home the point. *You must treat me as an equal.*

Tessie followed through with her threat to call the roll. She turned it into an opportunity to say hello to each of the directors. Another psychological point. *I can be your friend.* That formality completed, Tessie looked expectantly at Edwards.

"Yes, well. I think everybody knows why we're here." He was dangerously close to dithering. "Ms. Crocker has come here to assist us on a rather difficult matter. We need to work out the terms by which we compensate her for that assistance."

That pronouncement was vague enough to elicit a few supporting nods around the table.

"Excuse me, Mr. Edwards, but I need to clarify a couple of critical points." She had no sympathy for his discomfort, she had tried to warn him. "You're asking me to compass the death of one Arnold Santee. That's a serious matter. It skirts dangerously close to the felonious act of murder."

The nasty words were at last spoken aloud. Several people found fascinating spots on the carpet to contemplate.

"Now, I'm sure that none of us want to commit any felonies. I certainly don't. That's partly why I sent you such a detailed proposal. The law provides for very narrow circumstances under which a person can compass the death of another and avoid being convicted of felony murder or manslaughter. My proposal spells out those circumstances, as best we understand them today."

She wondered, as always, how many of the directors had actually read and understood her words. *Very few, likely enough.* She could be

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sure that most of them didn't like much of what they understood. Murder was not cheap, even when paid for out of corporate funds. And it wasn't completely antiseptic, even if blessed, after a fashion, by the U.S. Supreme Court.

"So I must clarify that I expect no subsequent compensation, should I happen to accomplish goals that you find desirable. That would be murder for hire. What we're here to discuss is whether Santee Castings is willing to make me a gift outright, under the circumstances I outlined in my proposal. What happens after that is between me and my conscience." She let the double meaning hang in the air for a spell.

Finally someone made a noise. A red-haired man with a pinched face cleared his throat and squirmed. That would be Andrew Bateson, the corporate controller. *Top flunky to Edwards*, thought Tessie.

"You're asking for a rather large 'gift,' I'd say." Such a large sum was probably the only consideration that could drive Bateson to speak. "And we really have no guarantees, you know."

"I get to keep only a small fraction of that, you know." She couldn't resist mocking his speech patterns. "The law is very clear regarding compensation for wrongful death in lieu of a felony conviction. Twice the median lifetime income of an able-bodied American. Half goes to the state as wite. The other half goes to the subject's estate as wergild."

There was that euphemism again. Tessie disliked the sterility of "subject." She disliked even more the specious respectability of the ancient words "wite" and "wergild." But they formed the basis for her profession.

"And you're right about the lack of guarantees. That's the nature of our particular business. You can judge an assassin only by his or her track record. I assume that's why you chose me." It didn't hurt to remind them that they had already made a partial commitment to her. And that she was good.

Bateson stirred again. "Yes, well, we thought about that." He dug into a briefcase at the ready by his chair. "We've prepared papers that we think are satisfactory. They provide for an escrow account that—"

Tessie chopped him off with a bald, "*Shit!*" Bateson blinked. Several board members scowled in disapproval. *As if a little strong language was out of place while plotting a murder.*

"Please forgive the vulgarism." Tessie understood by now the peculiar value system of people isolated by wealth from the harsher realities. "I simply draw your attention to the legal citations numbered three through seven in the papers I sent you. Page twenty-three." She adopted a pedantic tone. "All detail cases where the courts found what they so graciously call 'unclean hands' as a result of post conditions on payment."

She paused for emphasis. "Two of the assassins involved were hanged. The other three got the needle." Capital punishment was becoming ever swifter and surer throughout the land.

"Look, maybe I'd better review for

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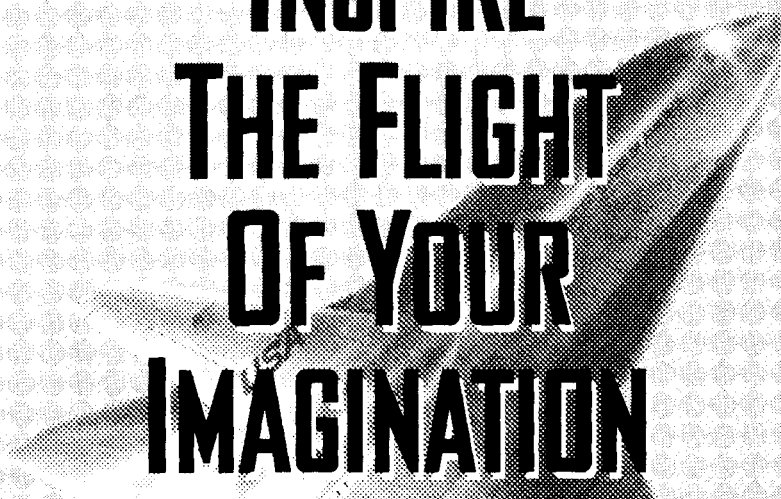

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you the legal precedents that permit me to work." A few appreciative nods and grunts. *Anything to put off the inevitable commitment.*

"You're probably familiar with the landmark case, *Gomez v. Dade County.*" A guarded nod or two. "Eight years ago, Enrique Gomez, a wealthy Miami businessman, shot to death one Norihito Saito. The evidence was overwhelming that Saito-san had savagely molested two young nephews of Mr. Gomez. Even Saito-san's relatives admitted that the world was better off with him out of it."

Most of the board was now looking her way, no longer quite so fascinated with spots on the carpet.

"Nevertheless, Mr. Gomez made no attempt to excuse his guilt. As an act of contrition, he even offered to pay a substantial sum to Saito-san's family, and a similar amount to the city of Miami to fund a treatment center for abused children. He did so with the clear understanding that he expected no leniency in return."

She looked straight at Bateson. "And that proved to be his salvation. Judge Thurston invoked English common law to justify clemency for Mr. Gomez. He decreed that Mr. Gomez had paid wite and wergild in accordance with long-standing tradition. As important, Mr. Gomez had demonstrated contrition for his heinous act. Hence, he need not be convicted or further punished. Most important of all, *the Japanese public approved of the decision.*"

She looked around the rest of the table. "I don't have to remind you how much of Miami's budget goes toward servicing interest on bonds held by Japanese banks. That city is no better off than this or any other municipality. At a stroke, Judge Thurston had invented another source of revenue as socially acceptable as taxes on alcohol, gambling, drugs, and prostitution."

Much of this was familiar urban folklore. Now for the lesser known details.

"Of course, Dade County wasn't going to let Miami keep the money. They brought fresh murder charges against Mr. Gomez. He appealed all the way to the Supreme Court, who let him off on double jeopardy. But their ruling was intentionally ambiguous about Judge Thurston's decision. Without explicitly saying so, the Supreme Court endorsed having individuals buy their way out of conviction and punishment for committing murder." Pause. "*And none of that justifies my presence here today.*"

She had their rapt attention now. Maybe they would hear and understand.

"What you should care about is the lesser known case, *Michigan v. Mulligan.* Number eleven, page twenty-four." A few academic souls started flipping through the papers in front of them. "That is the one solid precedent that covers assassination for hire. Judge Kumagai ruled that neither Lansing Auto Parts nor Michael Mulligan were guilty of murder, even though Lansing paid Mulligan to hunt down one Alvin Jenkins and strangle him to death.

"Judge Kumagai spelled out the

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critical steps in detail." She held up a hand to tick off points on fingers. "Lansing paid Mr. Mulligan a fee in advance to cover wite, wergild, and the cost of his services. The directors spelled out their intentions in a unanimous resolution of the board. They did not require that Mr. Mulligan deliver the goods to keep the money. Mr. Mulligan freely confessed his act and offered to pay wite to the state and wergild to the victim's family." Not *subject* this time, but *victim*.

Tessie grabbed her thumb to emphasize the fifth and last point. "Finally, Mr. Mulligan was obviously remorseful for what he had done." She let that sink in for a moment.

"To this day, nobody knows why Judge Kumagai ruled the way he did. He died of a heart attack a week after his ruling. What counts is that the ruling discounted any premeditation on the part of Lansing Auto Parts or Mr. Mulligan. And that it was upheld by the U.S. Supreme Court. And that, once again, the Japanese public considered this ruling a further step toward maturity by the American people."

She looked straight at Edwards this time. "What counts to me is that the Kumagai defense has held up dozens of times since, *when followed to the letter*. Nearly every attempt to vary it has proved to be disastrous for the active parties involved."

Edwards half smiled. "Looks like it was a useful ruling for you and your cohorts. It laid the groundwork for a whole new service industry. Or should I say a legal version of an old profession." His smile broadened with the veiled reference to prostitution. "And all you have to do to get off is learn how to fake contrition."

Tessie stared at him, disgust giving way to a rising temper. The anger boiled over. It was all she could do to keep from walking out in a huff.

"It's a horrible ruling, if you ask me. I'll welcome the day it's reversed, even if it does put me out of business." She leaned into the table, the better to glower at this callous man. Her immediate neighbors shrank away. "And don't think for a moment I have to fake anything. If I kill your cousin Arnie, you can bet I'll be contrite about it."

Control yourself, Tessie. She should not have mentioned the family relationship between Giles Edwards and Arnie, even if it was only through marriage.

Edwards was taken aback at her outburst. His face was ashen, fresh out of smiles. He struggled for a comeback, found none.

"Let's take another break," he said.

Tessie sat on the rim of the marble tub and cried. She knew better than to assert control of her emotions until she gave them free rein for a spell. She didn't know whether to stamp her feet in frustration or curl up in a fetal ball. Everything was going horribly.

She had made a beeline for the one sanctuary that she knew within Santee Castings. Randall Santee had been waiting outside the board room, but she had paid him no mind. The rest could decide what they wished about the state of her bladder and/or bow-

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els. She wasn't going to come out until she was damned good and ready.

What the hell is the matter with me? Since that first meeting with Randall last night, she had been continually off balance. Every time she thought she was back on track, something else blind-sided her. For all her gilt-edged reputation, and her much vaunted secret credentials, she was hardly more effective so far than a rank amateur.

And now she had committed three of the worst gaffes possible for an assassin. She had used the word *kill*. She had reminded a client that he had a familial attachment, however remote, to the victim. And, worst of all, she had lost her cool. *Merde.*

Can Arnie be doing all this to me? If that was the case, she was in deep trouble. She was no more than a pawn to his wild mental talent. But no, that didn't make sense. Many of his moves were too clumsy to fit that scenario. She had to assume that she had a fighting chance. *Then what the hell's going on?*

A sudden calm descended over her. Tessie dug for the cause, unwilling to take such a gift horse without checking its mouth. No luck. She worked backwards until she found the pivotal thought. It was that word *balance*. Any number of people seemed to want her off balance. No need to posit a conspiracy, or a *deus ex machina*. It was enough to know that the destabilizing forces came from without. *Well then, I'll show them.*

She gave herself over to five minutes of Stillness of the Body. No point yet in forcing the mind to follow. It would get what benefit it could from a calmer domicile. Then another round of face washing and primping. This time she touched up her powder from the tortoiseshell compact. As always, she took satisfaction in improving her feminine appeal with the aid of a lethal weapon.

A different Tessie opened the door to find Randall and Edith waiting for her. Concern melted to soft smiles as they took in her quiet self-assurance. Edith turned to leave, with her usual instinctive discretion.

"Wait, Edith. Please don't go. I need both of you for a few minutes." Edith nodded simply, closed the door to the room, then turned and waited for Tessie to speak.

Tessie decided to take a wild gamble. She walked up to Randall, grabbed him by the ears, and planted a protracted kiss on his lips. She broke it off as soon as she felt the mutual passion stirring.

"Randall Santee, half the time I'm around you, you're the suavest, smartest, most gorgeous man I've ever met. The other half, you're mush-for-brains. I can't believe you've survived this long with that modus operandi. When did you start suffering from such schizophrenic behavior?"

She flustered him enough to make him think. "I really don't know."

"Edith?"

"The first symptoms appeared about eight months ago. He's been getting steadily worse."

"Thanks, dear. Now you know why I asked you to stay." To Randall, "And

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now it's time for you to start thinking straight. We can't afford to have you wimping out anymore."

"So that's it, huh? I just couth up in an instant?"

"Yes." A quick peck on the cheek and she released him. "Trust me on this one."

Nodding toward Edith, "She indicated earlier in passing that Giles's mother was to be pitied. Care to tell me why you think that might be?" Tessie held up a warding hand to keep Edith quiet.

"Gee, I'm not sure. She died just last year, after a fairly brief illness. I thought she had led rather a full life." A scowl. "Oh, of course. She and Giles's father divorced shortly after he was born. I was barely old enough to understand what was going on. I know Giles hardly saw his father after that, and she never remarried."

A sober pause. "There were a few rumors that she had had an affair with my father, after Mother died I think. But then, Dad had so many women in his life."

Tessie turned to Edith, who stood in thin-lipped silence. Raised an eyebrow to ask for confirmation. Edith nodded. Once. Slowly.

"That's about it. You have to understand that many women were overwhelmed by the Santee charm." Tessie studied the older woman for a long moment. *I'm not going to pursue* that *connection any farther.*

"Thank you," softly. Then, to Randall, "Next question. When your father died, was there any thought given to making Giles the head of the company?"

Randall looked puzzled. "Well, he was Dad's CFO. Had been for several years. But no, I don't think there was any expectation that he would assume the top spot."

"Why not?"

"The name of the company *is* Santee Castings."

Tessie looked at Edith again.

"Randy's right, of course."

She looked back and forth between the two. It always amazed her how the most capable people could develop such enormous blind spots.

"Silly me." Her tone was scrupulously neutral.

Tessie took a step or two away from them, turned to face them again. "And now for the big question. Why does Arnie Santee have to die? No more bullshit. The simple truth."

Edith started to speak, but Randall stopped her with an abrupt gesture. "No. This is my responsibility.

"About six months ago, we found out that Arnie had been . . . taking advantage of . . . some of our female employees." Randall shook his head in disgust. "Malformed as he is in some ways, it never occurred to us that he would inherit the Santee . . . sex drive."

He sat down, slumped in his chair. "I hate to admit it, but our first reaction was to cover up the situation. We paid all the medical bills and costs of therapy. The women were sufficiently confused that they didn't really know what had happened to them."

Another disgusted shake of the head. "Fool that I was, I thought I could talk to Arnie. He told a story

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about how he ran across two of our employees making love in the Mansion House. Until then, he was a virgin, if only out of ignorance. At the next opportunity, he . . . influenced . . . a woman on the cleaning staff to submit to him. Arnie decided that sex with a woman was much more satisfying than masturbation, even if his partner was unwilling."

Edith sat down next to him. Put a supporting hand on his arm. He covered it with his own hand.

"Arnie swore he'd never do anything of the sort again. I chose to believe him." Another shake of the head. "Had I known then what I have since learned about addictive behavior, I would not have been so easily fooled. But I really wanted to believe my brother."

The two hands tightened in a painful grip. Tessie could guess what was coming.

"Then a month ago, the local papers started running stories with a nasty common theme. House women in nearby hotels started turning up on the street, badly injured. Some were incoherent, some just dazed. All were cruelly bruised or mutilated. And all were found within walking distance of Santee Castings." A long pause. "Two are still unaccounted for."

Randall fixed Tessie with a gaze half angry, half anguished. "Arnie has refused to talk to anybody. Food disappears from the Mansion House pantry, but nobody actually sees him. We couldn't figure out how he lured the women here, how he got them past the guards. That's when we decided to hire the Pinkertons. At least the depredations have stopped since they've come on board."

"That's a good sign." *At least until last night*, Tessie reminded herself. "How did you describe the problem to the Pinkertons?" Tessie asked.

"We didn't."

"Say what?"

"We felt it was best not to reveal too much."

She throttled back anger. How could people hire professionals to defend them to the death and not prepare them for the danger? *Altogether too easily*, she decided.

"Any chance that Giles Edwards first suggested how 'we' should feel?"

"Maybe. I suppose so." Randall.

"Yes." Edith. She was catching on.

"OK, I get the picture now," said Tessie. "One last question before we pick up where we left off. You know that anyone who profits from death by assassination 'pierces the veil' of the Kumagai protections. As Arnie's only surviving close blood relative, you are probably his only heir. Have you done anything about that?"

"Of course," testily. "I've already provided that any interest I have in Arnie's estate is to go into a blind trust. Only charities can profit from that trust."

"Have you *signed* those papers?"

"Yes. That is, I think so." Randall had the decency to look abashed.

"You think so. And who, may I ask, arranged to have those papers drawn up?"

"Why, Giles, of course. He handles all such matters."

Tessie could not avoid sarcasm. "One last question, and this time I

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mean it. Do you own a collection of baseball cards?"

"Why, uh, no."

"Good. That's at least one thing you haven't entrusted to your cousin." Dryly, "I have reason to believe that he may not always have your best interests at heart."

Turning to Edith. "OK, it's time to reassemble the board. Tell them that Randall and I will be there in five minutes. Yes, we'll need another chair. Then you go right to Randall's office and find those papers. He'd better get them signed before it's too late."

"Right." Edith was all business again. "And I'll pass them by Legal to look for any holes."

"I wouldn't bother. Read them yourself. If they make sense to you, they'll hold up in front of a judge. I think you'll find that Giles is too good at covering his ass to generate papers that are obviously flawed. 'Losing' them is more his style. Right now we just need to get them signed."

"And what do you want me to do at the board meeting?" Randall to Tessie.

"You're not my puppet. Do whatever you think is right at the time. Let's go."

For the third time that morning, Tessie marched into the board room at Santee Castings. This time the chair at the head of the table was vacant, in deference to Santee. Giles sat immediately to the right of that place of honor. The hot seat awaited her once more.

But this time Tessie ignored it. She marched to the head of the table and sat down. Whatever negative reactions that act may have engendered Tessie did not bother to record.

"OK, time to get serious. Mr. Bateson, I noticed a total of four folders in that voluminous briefcase of yours. Would you please be so kind as to pass them all to me?"

Bateson sputtered a protest, looked to Edwards for support. He in turn glanced warily toward the hot seat, now occupied by his boss.

"Do it," said Santee.

With all the relish of pulling his own molars, Bateson extracted the folders and laid them on the rosewood. Pushed them infinitesimally in Tessie's direction. A braver soul grabbed them and sent them the remaining distance.

"Thank you. Let's see what we have here. Ah, this must be the escrow account. Why, Mr. Bateson. As the only signatory to this document besides me, you would have the unique pleasure of being tried for murder as soon as I was convicted."

She dropped the offending folder on the carpet, opened the second one. Read it slowly.

"Hmm. What an interesting document. And generous too. It provides compensation to me should I happen to compass the death of one Arnold Santee as an act of self-defense. Nice of you to anticipate that Arnie might get peeved at me. And you even give me a 40 percent bonus over my usual cut. Of course, you did forget to mention any possible need for me to pay wite or wergild, absent a finding of self-defense. But who can complain? Mr. Santee, were these generous terms cleared with you beforehand?"

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"No." Tonelessly.

"Just as well. The courts tend to look on a meeting such as this one we're now enjoying as ample basis for dismissing out of hand any claim of self-defense. More likely, you'd all be tried as accessories to murder." They were starting to get the picture.

The folder followed its predecessor to the carpet.

"Oh, now, this is more like it," She held up a document half covered with change bars in the margin. "Looks like you at least started with my standard terms." She paused to read. "Yes, as I expected. If we execute this one, we can *all* plan to meet the needle before the year is out."

Another gentle flutter and thump.

"Ah, paydirt." Holding up the contents of the last folder. "Looks like you were all willing to sign my standard terms if all else failed. Of course, at this point, I'll want to go over any document you produce with a fine-tooth comb. That's how people build good will, you know."

She dusted her hands in an exaggerated gesture. "There now. We just saved several hours of sparring and ended up in the only place possible. Wasn't that efficient?" She looked around the table. *Not very many happy campers here.*

"Let's get down to business. Having come this far, you now face two choices. Either you instruct me to leave town as soon as possible, leaving your precious subject alone. Or you pass a unanimous board resolution in accordance with the terms I initially outlined. Any other course will most likely put us all in the clink awaiting our last meal. *Klar?*"

It was *klar* enough, apparently.

"OK, the next order of business is for me to ask each of you to state personally whether or not you support such a resolution. But before I do that, I have one other task to complete."

Edwards stirred. He had been in a deepening funk since Tessie had seized control of the agenda. "Now what?" he asked testily.

"Now I ask you all to consider deeply what you are about to commit to. We are talking about the unwilling demise of a fellow human being. However great the provocation, we must take all steps possible to avoid this unfortunate outcome."

She swept the table yet again. All eyes were on her this time. "You have paid me a nontrivial stipend just to bring me here for these discussions. I tell you now that I will do anything in my power to settle this matter, before we commit to causing the death of Arnold Santee. And I will charge nothing extra for my services. The onus is on you, however, to suggest a path worth exploring."

Edwards stirred and grumbled again. "I didn't know that the law required this nonsense." One would almost suspect that he was disappointed at the prospect of preventing a murder.

"The law doesn't, but *I* do." Pause. "I'll give you a few minutes."

They sat in silence. Tessie knew that the chances of a non-fatal settlement were remote. They always were by the time she was called in. Nevertheless, she had to try. At the least, it

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made board members reflect on the gravity of the actions they were about to undertake.

"OK. Time for another roll call. I see that each of you has in front of you a copy of the model board resolution I sent you. It grants me a gift outright in the amount stated and supports my actions in compassing the death of Arnold Santee. When I call your name, please answer 'yes' *only* if you fully understand the consequences of the resolution and support it. Otherwise, please answer 'no.' Any questions before we begin?" There were none.

By the luck of alphabetical ordering, Edwards was first. He answered with an emphatic, "Yes." That doubtless steeled a few nerves. Tessie's keen ear detected an emotional rainbow in the one-word affirmations that followed. Santee came near the end. His "Yes" was as clear as the first one, but tears filled his eyes as he spoke.

It was unanimous.

Tessie let silence reign once again. But this time it was not for dramatic effect. She was thinking. Here was truly her last opportunity to walk away. Whatever unspoken obligations she may have felt, she owed it to herself to make an active choice, one way or the other. She was a person incapable of blaming circumstances for giving her no palatable options. Finally she spoke.

"I accept this assignment. I have to say that it is a difficult choice for me. It is, of course, a very risky thing that you're asking me to do, given the peculiar abilities of the subject. But beyond that, I have found myself more personally involved in the particulars of your problem than I usually permit myself. I share your sense of failure that we have all come to this point. I am truly sorry."

That was not her usual acceptance speech. There were no thanks for the vote of confidence, no assurances that she would do the job with grace and dispatch. Somehow, none of that seemed appropriate this time. She simply sat there with her head bowed.

Edwards took over the formalities. The board meeting proceeded as if she weren't there, except that people spoke in hushed tones and avoided intruding into her private space. Tessie listened with half an ear as the board resolution was signed and duplicated for her, as Edith was called in to transfer funds to her account. She barely noticed the closing activities or the rapid evacuation by the sober board members.

When she looked up, Randall sat alone at the far end of the table, waiting patiently.

"Are you OK?" he asked.

"Well enough, thanks. At least I will be soon."

"Good. What do you need next?" *Businesslike.*

"Please inform Shimizu-san that I would like to have lunch with him and half a dozen of his best. Nothing fancy. Bento will be fine. Then we're going up to the Mansion House for a look around."

"OK. I'll go with you."

Tessie thought about that offer. She didn't like endangering a client. *Endangering Randall!* And Arnie cer-

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tainly had a practiced tool in his half brother. Randall could be a danger to the rest of them as well. On the other hand, there were things he could point out to them that they might otherwise overlook. And Tessie did not want to deny him the opportunity to redeem himself in any way that he felt he could.

"OK," was all she said in response. Then, "I'll be along soon."

Randall took that for the dismissal it was and left her alone.

Tessie meditated upon the business of assassination. People initially assumed that allowing a payoff for murder, in any form, would mean that nobody was safe anymore. Any company large enough to raise the resources could pick a victim at random and cause his or her death within a matter of days. All perfectly legal. (That was one of the more popular TV plot premises a few years earlier.)

In fact, such arbitrariness soon proved to be a non problem. It cost serious bucks to pay wite and wergild. For all their folly in legalizing murder, the courts were wise to set the price so high. Killing people was simply bad business most of the time. A company certainly didn't squander such resources on whims, or even on minor annoyances.

Other people assumed that the business would spawn a multitude of killers for hire. There were plenty of people who would kill just for pleasure, if they could get away with it. The doom sayers predicted a day when dime-a-dozen thugs would terrorize the streets. (As if they didn't already.) But once again, the high and fixed price of wite and wergild saved the day. The difference in price between the best and the worst was small in terms of percentages. And business soon found that cheap killers were a bad bargain. You could face the needle yourself if a thug botched the paper work.

The result was a select corps of skilled assassins. They had to be as good at managing board meetings, and investing funds, as they were at the coarser mechanics of their trade. They learned to prize discretion and to be scrupulous with the law. The law was happy to return the compliment, cloaking their actions with a veil of secrecy. Not the least adept of this crew was one T.L. Crocker. It was a name unknown to the public at large, but one widely whispered in the executive washrooms of desperate companies.

And that was what Tessie found the most pernicious about her business. Desperate people seldom go so far as to commit desperate acts. A knife is a very intimate weapon. Even a gun demands a level of confrontation that few people can steel themselves to. By its sheer enormity, murder serves as its own deterrent.

But a board resolution, ah, there's a more antiseptic weapon. Companies had decades of practice at robbing people and stealing property with such bits of paper. All perfectly legal. What a boon to commerce to extend that power to the sometimes useful act of ending a troublesome life. It was enough to cause the ambitious business person to rework the cost-

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benefits analysis of a few major deals. It was enough, in short, to turn any number of people into murderers.

For a company to hire an assassin, someone had to cross over that line. An otherwise respectable person had to make the emotional commitment to becoming a murderer, then sell that icy necessity to a board of directors. What Tessie and her cohorts did was ease the follow-through. They lowered the barriers that society had erected over millennia against civilized beings killing one another.

Tessie knew she was not rationalizing away her own guilt. She had her own rigid code for dealing with her victims. By many people's standards, her conduct was humane and above reproach. Still, she knew that she would one day stand before her God with much to answer to. Her role in the deaths of so many people was just a part of that list. No, Tessie bore her full share of blame.

Nevertheless, she knew that a serious consequence of her professional skill was to weaken the moral fabric of American business. Given what her nation was going through economically, that fabric was already severely strained. But economic bankruptcy did not have to lead to moral bankruptcy. Not if a few able and dedicated people fought hard enough against it.

That battle was what brought Tessie into the neo-samurai. They taught her how to go into a company and sift out motivations. Find, among all the warring emotions and considerations, that one person who was the driving engine behind the assassination. Don't assume it is the meanest, or the angriest, or the one who stands the most to gain. But find that true instigator at all costs and pass the name on to others who care. Let them watch and wait and be ready to act, should the need arise. (And, so often, it did.)

It is easiest to stop a cancer when it is still a single cell.

Tessie knew who her murderer was at Santee Castings. She had plenty of hints along the way, but she had to be sure. Now she was. She was sure when that last vote was cast by the board. The only person who was smiling then was Giles Edwards.

And now Tessie had to help him get away with murder. ■

To be concluded in the next issue.

When action grows unprofitable, gather information; when information grows unprofitable, sleep.

Ursula K. LeGuin

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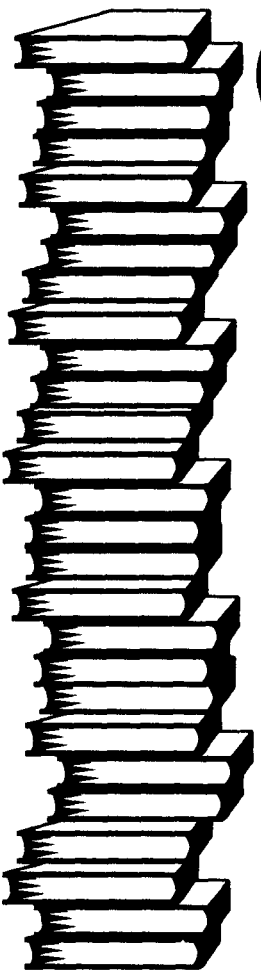

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G. Harry Stine

THE ROOSTER CROWS AT WHITE SANDS

This should mark the beginning of a new era. Will it?

At 11:12:02 A.M. Mountain Daylight Time on Saturday, 11 September 1993, a new kind of rocket lifted off at White Sands, New Mexico. It climbed to an altitude of 300 feet, hovered, moved horizontally 350 feet to the southwest, hovered again, lowered its landing gear, and descended to a soft and controlled landing 3.5 feet right and 1.5 feet short of its intended landing point. The entire flight lasted 66 seconds.

So what? Big flight!

Yes, big flight.

Takeoff of the first flight of the Delta Clipper DC-X at White Sands on 18 August 1993. (WSMR Photo)

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History is full of other such flights that were portentous.

On 17 December 1903 at Kitty Hawk, NC, Orville Wright flew a fragile wood-and-canvas aeroplane 120 feet in 12 seconds. On the second flight less than an hour later, Wilbur Wright flew the same machine a distance of 75 feet in 13 seconds. By noon, a fourth flight had been made to a distance of 852 feet in 59 seconds.

On 16 March 1926 on Aunt Effie's farm near Auburn, Massachusetts, Dr. Robert H. Goddard flew a liquid propellant rocket that took off, flew for 3 seconds, and crashed 184 feet from the launcher.

I hadn't been born when the flights were made at Kitty Hawk and Aunt Effie's farm, although I've been to both places. But I was there at White Sands for the second flight of the McDonnell Douglas Delta Clipper DC-X on 11 September 1993.

No one but the 50-person flight test crew saw the first DC-X flight on 18 August 1993. About a thousand people saw the second one.

Why do I have the audacity to compare the flights of the DC-X to those of the Wright brothers and Doctor Robert H. Goddard?

Because all these flights smashed paradigms.

And very few people knew it at the time. Nothing about the Kitty Hawk flights appeared in the newspapers. Nothing about Goddard's first flight appeared in the newspapers. And very little about the flight of the DC-X showed up in the various news media. The first DC-X flight got a short segment on NBC Nightly News and CNN. The second flight got a short segment on CNN. Some local newspapers carried the news of the second flight. But it wasn't big news.

Robert A. Heinlein (everyone agreed he should have been there to witness it) said: "*There is nothing as commonplace as a ninety-day wonder on the ninety-first day.*"

The DC-X has shattered the old paradigms and proved again that the path of progress really hasn't changed very much. Since this isn't a news magazine and you're reading this months after the event, I'm going to concentrate on more than the gee-whiz aspects of the DC-X and its promise for the future. Other articles in this magazine have already done that.

Before Kitty Hawk, no one could fly. Before Aunt Effie's farm, no one could get a liquid propellant rocket to fly. Afterward, nearly everyone who wanted to could and did. And performance improved dramatically.

Before the DC-X flights—please note the plural—a rocket was a single-flight piece of ammunition (except for the model rockets I started flying at White Sands in 1957 and still fly today). I saw the *second* flight of the DC-X. It was probably more significant than the clandestine first flight (euphemistically called a "bunny hop" or "equivalent to an experimental aircraft's first high-speed taxi test" by the project spokespeople). That second flight proved it was a *reusable* rocket. It also proved beyond a doubt that the first flight wasn't a fluke.

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Almost as a sideline, it showed that a major breakthrough in technology could be carried out in 21 months for only $60 million by a team of about 100 people. In the era of multi-billion dollar space projects (a lot of which don't work or create mountains of paper) that take 10 years or more and provide jobs for techno-bureaucrats, this was unheard of. In fact, some anti-DC-X "experts" are eating the word "impossible" right now.

The DC-X flight also spelled the beginning of the end of long-range artillery shells (ICBMs and their modified progeny) used as space launch vehicles. This has caused some problems among those who favor them. But that's a separate report.

The DC-X showed that we could accomplish in the real world what we'd written about in science fiction for decades: A space ship that takes off vertically under rocket power, maneuvers horizontally under rocket power, and lands vertically under rocket power.

Furthermore, the "thread of history" ran through the DC-X flights. The "flight manager" was Charles "Pete" Conrad who had already made one controlled rocket-powered landing and takeoff—on the Moon.

The reason I maintain that the first flights of the DC-X are right in the center lane of technological progress stems from what such technological visionaries as the late Robert Heinlein, the late Herman Kahn, the late Dandridge M. Cole, Dr. Robert Prehoda, Dr. J. Peter Vajk, Arthur C. Clarke, and I have been saying for 40 years: "Technologists and the people who hire them prefer to improve familiar technology by a fraction of a percent than to gamble on a major improvement. They manage to make marginal improvements on old technology just before it becomes obsolete."

Sometimes, it isn't new technology that does the trick. The novel application of *old technology* can do it, too. Or a combination of old and new technologies with a new philosophy that changes the entire paradigm or accepted way of doing things.

The DC-X is an excellent example of this.

I called it a "junkyard rocket" in a newspaper interview on the day of the second flight. This caused some expressions of disapproval, to put it mildly, on the part of the DC-X people. But it's true.

One of the rules of the DC-X program was, "Not one thin dime for R&D! Do it with equipment and technology that's off the shelf and exists!"

The Delta Clipper Team did just that. Fortunately, during the past 30 years of the NASA national space program, a *lot* of technology has been developed. Some of it was used only once. Some of it wasn't useful at the time and was put back on the shelf. But it's there. We've paid for it. It works.

Forced by the rules of the DC-X game, the Delta Clipper Team used the available and reliable Pratt & Whitney RL-10 rocket engines originally developed in 1960 for the Centaur program and used in the Saturn-I to power the S-4 stage.

The F-15's navigation system and

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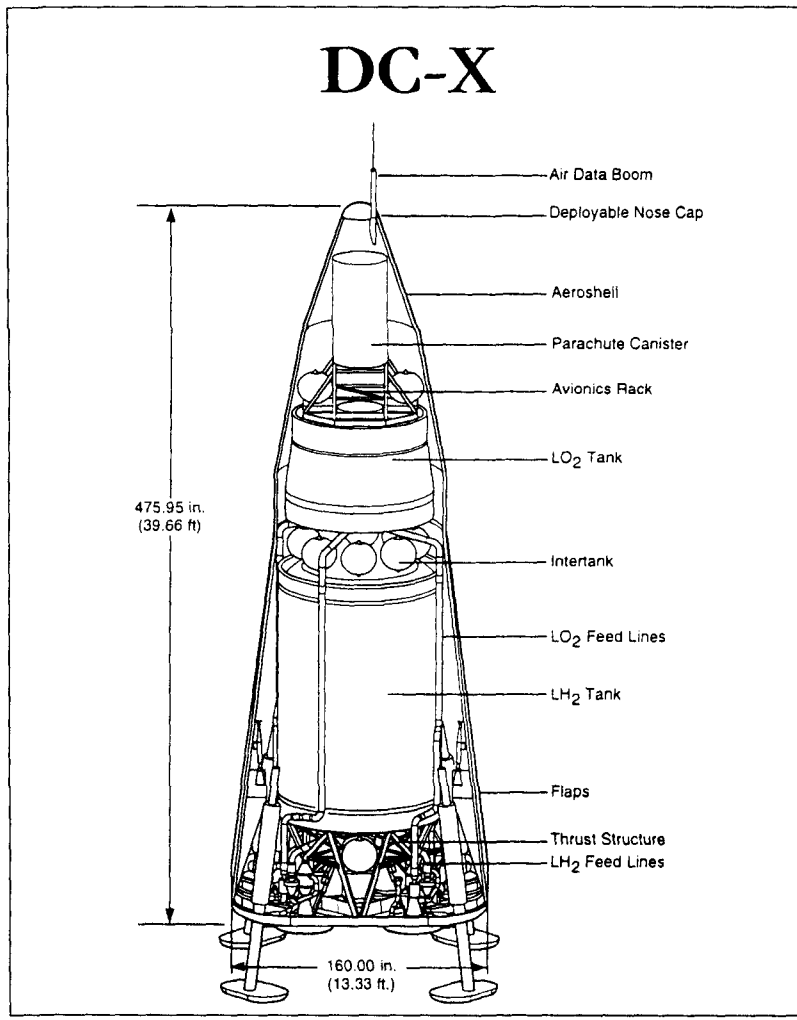
ring laser gyros and the F/A-18's accelerometer and rate gyro package were pulled off the shelf and modified.

The McDonnell-Douglas MD-11 autopilot and avionics were plugged into the system. (Paul L. Klevatt, the DC-X program manager, told me, "The DC-X really thinks it's an MD-11 operating on a strange flight plan.")

Off-the-shelf Honeywell equipment such as the Global Positioning System (GPS) receiver and radar altimeter were used.

In the 40-foot Flight Operations Control Center (the "blockhouse"



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that really was the trailer from an 18-wheeler) were off-the-shelf commercial PC computers run by only three people. Modern software development tools such as ISI's MATRIX SystemBuild, AutoCode/AutoDoc, and AC-100 hardware-in-the-loop software prototyping tools were used to develop the flight control algorithms representing over 30,000 lines of Ada language code that makes the DC-X a "smart rocket."

The tankage was built by Chicago Bridge & Iron Services, Inc.

The composite aeroshell came from Scaled Composites, Burt Rutan's operation at Mohave, California, that built the Voyager round-the-world airplane.

Where subcontractors didn't have off-the-shelf equipment and technology, McDonnell-Douglas engineers scrounged through the aerospace junkyards up and down the West Coast. They looked for and found such items as titanium pressure spheres, hydraulic actuators, and other components designed and built for other aerospace vehicles. (They may not want to talk about it now, but in February 1992 they asked if I could help.) Some of the hinges and hatch-closing springs around the DC-X tail use hardware that came from Home Depot, K mart, Tru-Value, and other ordinary sources. ("To hell with NASA qual and MIL specs! Will it work? This is an experimental rocket, not an operational one! We have cost and time deadlines to meet!")

The DC-X is indeed a "junkyard rocket."

I felt very good about this and about being at White Sands to see it fly. Back in 1956, Ace Books published my third "Lee Correy" novel, *Contraband Rocket.* In that book, a group of space enthusiasts bought a junkyard spaceship and, using junkyard parts, rebuilt it at White Sands Spaceport and flew it to the Moon. They encountered all sorts of problems and troubles faced by people who try to make equipment work the way it's supposed to. They ran into failures, glitches, and show-stoppers. To anyone who hasn't done this sort of thing with a car, a dishwasher, an airplane, or a rocket, for example, these occurrences sound fantastic and improbable. But they're part and parcel of making something work.

The second flight of the DC-X was another example of this, and I felt right at home.

Little of what went on behind the scenes was made public or announced on the PA system. But I had Delta Clipper Team people come up to me and tell me, "You may not believe this, but do you know what happened . . . ?"

The "Clipper Site" is on White Sands Space Harbor, a runway that has been used once for a space shuttle Orbiter landing. It can still be used for this, but NASA will do so only in a last-ditch emergency. The runway is merely a stretch of white gypsum sand. The wind blows a lot there. The white gypsum sand is carried by the wind into every nook and cranny of everything. NASA had to spend an inordinate amount of time cleaning white gypsum sand out of the Orbiter Columbia in 1982 after landing there.

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As a result, White Sands Space Harbor is now primarily used by shuttle astronauts for simulated orbiter landings flying the modified Gulfstream II jet aircraft. Before the shuttle came along, I knew the place as the Northrup Strip that was often used to land the Northrop drone aircraft. (A misspelling of the name was carried into the White Sands maps and has remained as the "Northrup Strip" for 45 years.)

When the wind blows at Northrup Strip, the sand blows. And both the wind and the sand blow a lot and at very high velocities. Especially during thunderstorms. During June, July, and August, thunderstorms occur almost daily. They are not the nice, soft thunderstorms often experienced elsewhere. These are "thunderboomers" of the most potent sort. They are violent. I described one in *Contraband Rocket.* Lightning is bright blue and crackly. The rumble of the shuttle liftoff is as nothing to the brisance and decibels of the resulting thunder. And the rain that comes out of these storms can only be described as "intense," dropping as much as three to four inches of water in less than an hour. On the level gypsum sand flats, this rainwater can't be described as "runoff" because it hasn't got any place to run to. So it puddles deeply in any spot.

A few days before the critical September flight test, a thunderboomer visited the Clipper Site. It blew the doors off the canvas-covered "hangar" that houses the DC-X between flights. The rainwater filled the trenches where the cryogenic feed lines run from the separate areas for the LOX and LH storage tanker trailers to the launch stand. The White Sands fire department had to come out to the Clipper Site and pump the water out of the ditches.

During the four months the DC-X was at the NASA White Sands Test Facility for static testing engines and more than a month at the Clipper Site, the Delta Clipper Team had to re-learn some of the things we knew at White Sands nearly a half-century ago:

Never set a tool down in the sunlight. You will need asbestos gloves to pick it up three minutes later.

Gypsum sand penetrates polyethylene sheeting by means of a type of osmosis not yet understood.

Rattlesnakes and other desert fauna will be found curled up inside warm electronic equipment that has been left on overnight.

The day-night temperature swings of 50° to 60° F give real meaning to the coefficient of thermal expansion of dissimilar materials.

A rocket standing vertically on its launch stand is the world's finest lightning rod.

The lack of humidity won't cause corrosion problems, but you will discover interesting new ways that plastics and composites delaminate when the air temperature is 105° F and the dew point is 30° F. This also has human ramifications because you don't realize you're sweating until dehydration causes you to check out temporarily. A one-gallon water jug will last you about four hours before needing a refill.

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Intense solar ultra-violet radiation does nasty things to unprotected human skin and unprotected plastics. We now have Sun blocker lotions for people. Such a thing would be useful for plastics. Not only does the u-v take plastics apart, but the extreme insolation literally boils the plasticizer out of most plastics.

When working high on a rocket, either on a lift or a gantry, tie tools to your belt with a lanyard. Otherwise, working around the base of the rocket becomes hazardous to your health if someone drops a wrench. Such a dropped tool can be heard if it bounces off scaffolding on the way down. However, if dropped from a cherry-picker, it's very stealthy.

The Delta Clipper Team learned.

This still didn't keep them from having familiar old problems on 11 September 1993. I was fortunate to be next to someone who had a hand scanner tuned to the command frequency, so I heard it all.

By the time the crowd of about a thousand VIPs and the Bohemian Brigade of media types got to the viewing site at 8:00 A.M. after a departure from Las Cruces on Grey Line buses at oh-dark-thirty, the pre-flight check was well under way. Liftoff was scheduled for 9:00 A.M. with engine start at 08:59:57. It didn't happen that way, of course. That didn't bother me; this is an experimental program, and I didn't care if the prototype spaceship flew on schedule or not. (In 15 years or so, people are going to bitch loudly about on-time departures, of course.)

Pete Conrad and Paul Klevatt didn't run a regular countdown, either. It may have sounded that way to the other VIPs, but I was listening to the command net on the scanner. It was more like checking out an airplane. They ran check lists. They jumped time. Then they held time. Then they picked up time with a huge jump in the "count-down." In some ways, it was like firing a V-2 rocket; certain things had to be done by a certain time, and only the last minute or so was there a "count-down" of the sort NASA is married to. I've also been around a lot of airplanes, and it was like getting an X-airplane ready to fly or even checking out a Boeing 747-400 ready to depart non-stop for Australia.

I didn't have a tape recorder running, so the following reportage of what occurred is accurate to the best of my recollection. I tried not to add to what is already a series of happenings that might be right out of fiction, except few readers would believe the fiction.

A computer in the Flight Operations Control Center (FOCC, although strangely enough I never heard anyone refer to it as the Foxy trailer) right behind the viewing site suddenly got the hiccups. They pulled boards and ran diagnostics. They didn't think it was the software. It had to be the board. So they called the McDonnell-Douglas factory at Huntington Beach, California. They'd fly a new computer right from Long Beach to Northrup Strip on a McDonnell-Douglas corporate jet. Be there in three hours. Then someone in the FOCC did something—no one

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would admit to what was done but I suspect the sudden application of the sole of a shoe or the impact of a hammer or the equivalent used to discipline balky computers—and the computer began to work perfectly. They watched it closely for an hour or so while they were solving other little problems, and the glitch never repeated itself. I guess the corporate jet either didn't take off or turned around.

They encountered telemetry signal drop-outs. In a smart rocket like the DC-X during an experimental test program, this is real serious stuff. Conrad, the two others on the launch crew, and the few project types in the FOCC didn't know if the DC-X was behaving itself and doing what it was supposed to be doing... or not. They'd never had telemetry drop-outs before. Then someone woke up to the fact that they'd never had a thousand people wandering around before, either. It turned out that VIPs were walking and standing in front of the telemetry receiving antennas. The people were moved out of the way, and the telemetry behaved itself once again.

Loading of liquid oxygen and liquid hydrogen, the only two propellants used in the DC-X, began at 10:04 A.M.. This went well until a valve in the DC-X stuck and wouldn't cycle. Repeated attempts to get it to cycle were to no avail. So one of the seven-man ground crew was told to pick up a hammer (naturally), go down to the DC-X three miles away, and hit the valve a couple of licks. This is a real fun assignment, believe me. Working around lots of liquid oxygen and liquid hydrogen is not my idea of a good time, which is why I haven't done it a lot lately. It was bad enough when *Viking* rocket #10 blew up 100 yards away and I had a corner of the blockhouse to duck behind. I was also younger then and immortal. Happily, the undaunted ground crewman in his red coveralls didn't have to risk his immortality. As the jeep roared away, Conrad called it back. Just like old times, the valve had suddenly decided to work properly.

"We're losing on-board helium pressure," came the report.

"Must be a leak. Can we override the pressurization procedure and pump it up shortly before engine start?"

"We'll try. But we may not have enough post-landing pressure."

"We'll go with it." It turned out they had more than enough post-flight pressure. Even in a test program, you don't want to use up redundancy without good reason.

Then the check list got down to the recovery generator. Once the DC-X lands and safes itself, it needs electric power for further post-flight actions. The generator was parked next to the VIP bleachers on the road, hitched as a tailer behind a van. This was an ordinary, garden-variety electric generator run by a gasoline engine, a standard piece of Army equipment loaned to the DC-X program by White Sands. The generator was scheduled to be started and running before launch so it could be spirited down the road to the landing site and plugged into the bird at once. The

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DC-X has lots of redundancy built into it, but the project people had spent their limited money on that and not on redundant ground equipment. That created a problem right then.

The generator wouldn't start.

Then someone remembered to put gasoline in it.

When it started, the ground crew got no indication of electrical output.

"The White Sands people say it was working fine when they shut it down last night."

"Get them over here!"

Silence on the net. Then: "They pulled the main circuit breaker last night. They never told us the generator had one. The breaker is sort of hidden. We pushed the breaker back in, and it's working fine now!"

"We've *got* to modify this check list," Conrad decided.

It was clear sailing from that point. A few minutes before takeoff, the DC-X performed an internal automated systems check and decided it was ready to fly. The DC-X is a smart rocket with lots of on-board automation. Back in the FOCC, Conrad had the option of aborting at any point using his PC. (He's known by the the Delta Clipper Team as "Mousekewitz" Conrad, the man with the fastest mouse in the West.)

At 11:11:59, the rocket commanded engine start. In the first three seconds of engine operation, the on-board software checked out the four RL-10 engines and determined everything to be OK at 30% of rated thrust, ordered engine throttle up, and the DC-X lifted off its launch stand.

At 300 feet altitude, the engines were throttled back to cause the DC-X to hover. Except for the bright orange flame caused by the rocket exhaust burning the paint off the launch stand flame bucket in the first second or so, the RL-10 engines produce no visible exhaust flame. Occasionally, a streak of orange would appear in the exhaust as an engine was throttled, usually by cutting back the oxidizer before the fuel, thereby creating a visible hydrogen-rich exhaust.

We're all used to seeing a rocket take off and go up and out of sight. It's strange and unusual to see a rocket lift off, climb, stop, and hover.

Then the DC-X began to move *sideways* in flight, swiveling its gymballed rocket engines about 2 degrees to provide directional control.

The muted rumble of the rocket engines could be heard about 15 seconds after liftoff. It was not as loud as a 737-300 taking off from an airport.

Once the on-board GPS receiver said the DC-X was over the landing point, the engines were throttled and it began to descend, tail first. The four landing legs popped out on schedule. It touched down at about 3 feet per second amidst orange flame from the fuel-rich throttled engines. Once it got a weight-on-gear indication, it shut itself down and began its self-safing procedures. It landed 3.5 feet right and 1.5 feet short of the landing pad center.

The caravan with vans carrying the seven ground-crew members, the generator, and a fire engine took off at once for the landing site. The report came back that everything was fine. The paint had been scorched on the

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downwind side of the DC-X. But Paul Klevatt said it would be cleaned up easily with a little green liquid industrial cleaner and a scrub brush. The DC-X would fly again in a week or so, continuing its test program during which the Delta Clipper Team will "push the edge of the envelope" just like the X-1 and X-15 programs.

I guess the crowd cheered after the engines shut down. I was cheering too loudly myself to hear it. I do know that in spite of the low humidity, there wasn't a dry eye in the crowd. This included several well-known science fiction authors. Chalk it up to the bright sunlight.

I've flown thousands of rockets, big and little, for 42 years. I hope to fly and see a lot more. But there was a sense of seeing something important happen out over those blinding white sands that morning.

Some will say it was our next important step toward space travel for everyone. I believe this is true, and it's coming along right about on schedule.

Furthermore, the way it was done had a *good* and a *right* feeling to it. *This is the way we've always built airplanes!*

It was confirmation that we do indeed know something about how technology progresses. It proved that we can really make technology work for us in peaceful, frontier-expanding ways now that we're in the post-war era of the 45-Year War (or 75-Year War, depending on when you want to start counting). We no longer have to beat the Soviets. We only have to beat ourselves, those among us who still maintain that we've passed our peak, that technology is out of hand, that we can no longer do anything for less than ten billion dollars spent over ten years of time.

We can. We did. We just have to keep doing it. We aren't off this planet yet, and we have just begun to use technology wisely to help us solve our problems.

But it looks like we'll continue to do it in the same seemingly halting and stupid way we always have, making lots of mistakes and learning from them. Hey, that's just the way it's done best, that's all. Recently, we've spent too many years during which we haven't been allowed to do that.

We're back on track, at least in the area of space transportation.

Ralph Waldo Emerson wrote: *"We think our civilization near its meridian, but we are yet only at the cock-crowing and the morning star."* ■

ANALOG *RECEIVED THIS NOTE NOVEMBER 18, 1993:* DC-X and DC-X2 got $40 million for fiscal year 1994. The program proceeds on schedule. The rooster continues to crow, and the morning star is bright.

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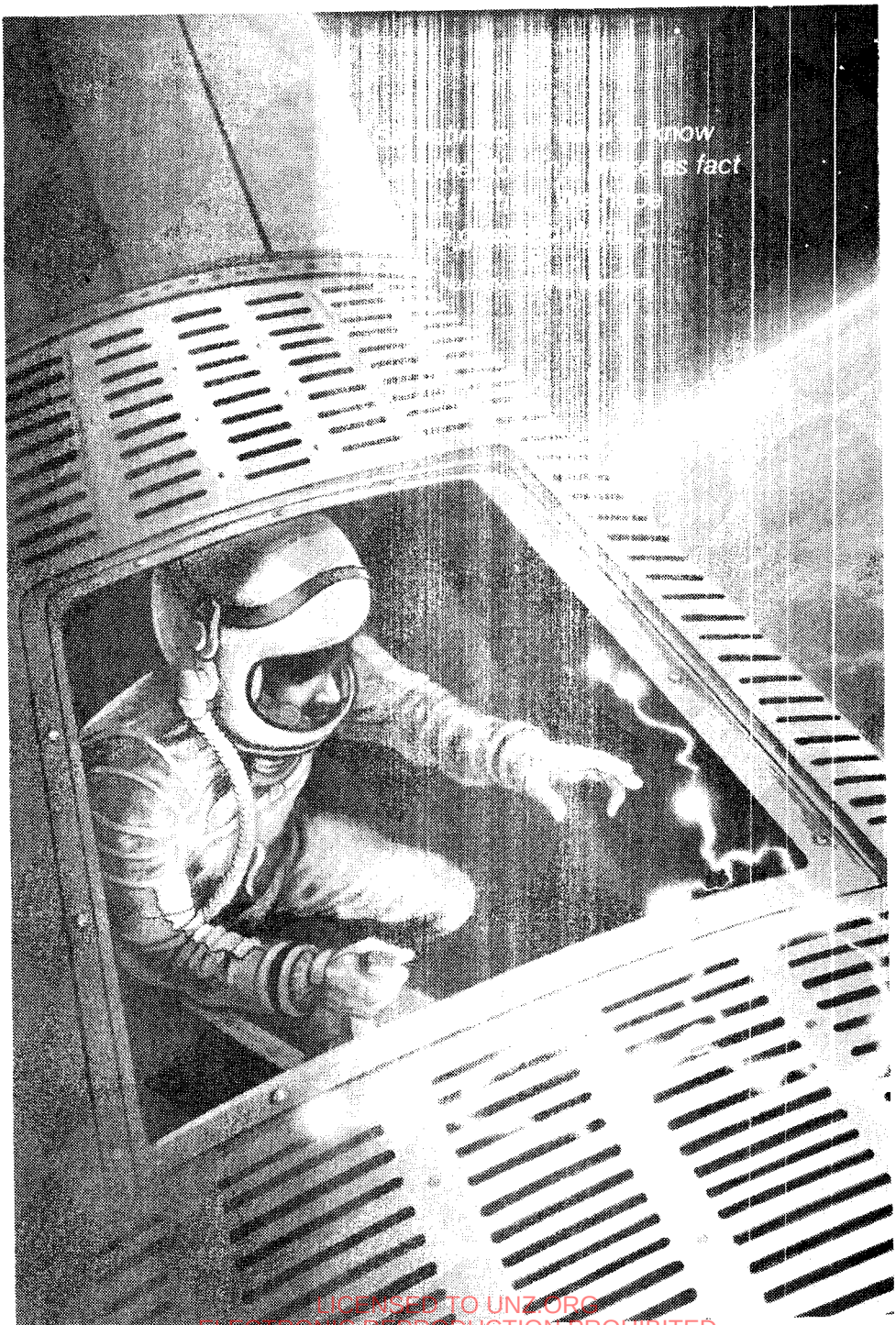

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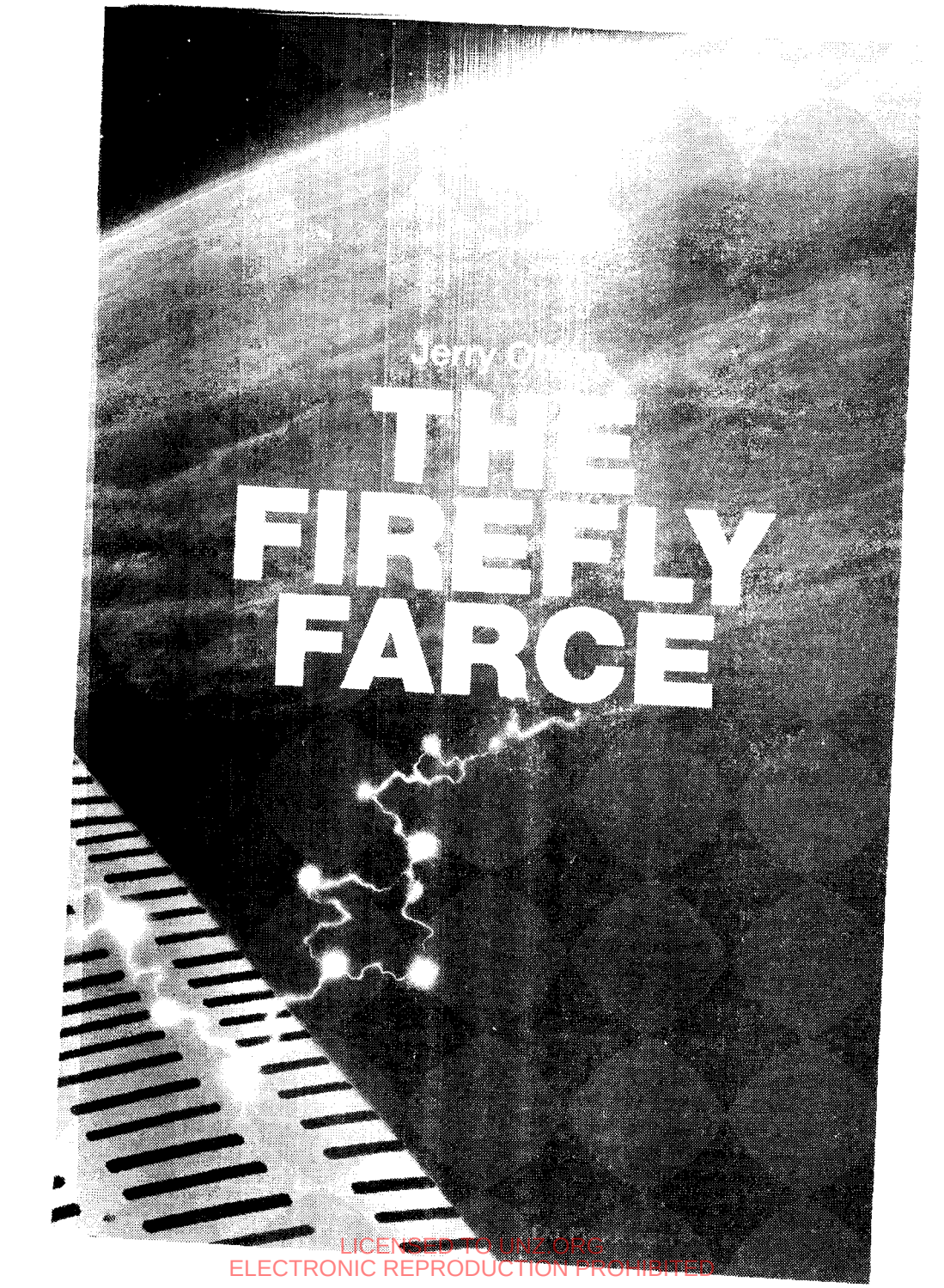

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Stanley Schmidt, Editor
Analog Science Fiction and Fact
1540 Broadway
New York, NY 10036

Dear Stan,

I know it's unusual to start a story with the cover letter, but here we are; that's the title up there, and this is, indeed, part of the story. It's also all the cover letter you're going to get, because the story is already complicated enough without adding yet another layer to it.

So here goes: A couple months ago while Kathy and I were doing the dishes after lunch, I got what I thought was a good, if silly, idea for a story. I'd just read Ben Bova's "Conspiracy Theory" in the April, 1993 issue (the same issue as my own "Hit and Run" [Great illo from Laura Freas, by the way—she really did her homework!]), and I was still mulling over Bova's line about "the uninformed parts of the government—which is most of them," when the idea hit me: What if John Glenn was in on it?

I immediately abandoned the idea of a Martian conspiracy, because Bova had already written about that. But Glenn did have quite an interesting three orbits back in 1962, what with seeing "fireflies" outside his capsule and having ground control think his heat shield had come loose before re-entry. I thought, "What if the fireflies were actually aliens, and they contacted Glenn in orbit, maybe even repaired his ship for him? And what if he's been keeping it secret ever since?" I tried to figure out why that might be, and when I came up with a plausible explanation, I sat down and wrote a story about it. Of course the story didn't turn out quite the way I'd originally envisioned it, but they never do.

But now we come to the strange part. Since I was using his name directly, I figured maybe I ought to let Senator Glenn see the story before I sent it to you, so I printed it out and sent it off to him. My letter to him follows. The story itself and his response to it follow that.

I've got to confess, I'm not sure if he's just having me on or if I've really latched onto something here. What do you think?

Best,
JERRY OLTION

Senator John Glenn
United States Senate
Washington, DC 20510

Dear Senator Glenn:

I am a professional science fiction writer. I mostly write "hard science fiction," stories dealing with future technologies and their impact on society. Sometimes I focus on the present day, or even the recent past, which brings me to the point of this letter. I have written a story which deals with your historic space flight, and I am writing to you for your response before I seek publication for it.

Let me stress that this is fiction, and will be marketed as such. I'm not asking you to support any of it; I just thought since it deals with an alternate interpretation of a real event in

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your life, you might want to read it over for your own amusement. Also, I guess I'd feel better trying to get it published if I knew you liked the story.

Of course if you have any suggestions for improving it, I would be glad to consider them. I have tried to get as many of the details right as possible, but short of flying to Washington DC (which is hard to justify as a research expense on a single short story, no matter what my fictional character does), I have had to make do with what I can glean from the public library.

Any criticism or suggestions you care to make would be welcome, but mostly I just hope you enjoy the story. Thank you for your time and consideration.

Sincerely,
JERRY OLTION

THE ALIEN STUFF
by Jerry Oltion

The senate office building echoed with activity. I wondered why they didn't carpet the place, but a few minutes spent watching the ebb and flow of traffic in the hallways showed me why: with as many people as walked through there, they'd be replacing the carpet a couple times a year.

Besides, the tile and stonework lent it an air of majesty that wallboard and carpet couldn't match. Government buildings *should* echo, I thought. Maybe it would remind the people who worked there that their actions also echoed throughout the country.

An officious-looking, overdressed high-school girl—probably a page, I figured—brushed by me and disappeared into the office across the hall. I was leaning against the wall, nervously glancing at my watch and wishing I wasn't twenty minutes early for my appointment with Senator Glenn. I felt completely out of place there. I'm not a political person; to me the entire democratic process seems designed to obstruct consensus and impede progress rather than assist it, and what I'd seen in the day since I'd arrived in town had only confirmed that belief. Besides which, I can't stand cities and I'm not a people person.

But I had a story to research, so there I was, jet lagged and red eyed from flying standby clear across the country, and itching uncomfortably in the suit I normally wore only for funerals. I was about to loosen my tie another half-inch when I spotted the senator himself walking down the hallway toward me.

He was shorter than I'd expected, but I knew I shouldn't have been surprised. They picked short guys for the Mercury program so they could fit them into the capsules. I didn't realize I was staring at him until he walked straight up to me and said, "Hi, is there something I can do for you?"

I'm sure I must have blushed. I know I stammered, "I—I'm your eleven o'clock. Appointment, that is."

He didn't look at his watch, just nodded toward his office and said, "Come on in." Before I could protest that I was early, he led me in past the receptionist, past other people wait-

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ing to talk to him, past a couple more secretaries, pausing only to pick up a sheaf of messages one of them held out to him, then ushered me into his inner office (carpeted, I noted) and sat me down in a big leather chair in front of his immense oak desk. He sat down in the ergonomic office chair behind the desk and asked, "So what can I do for you?"

My mouth was so dry I wasn't sure I could even speak. I was sitting in John Glenn's office! There on the wall were pictures of the Mercury astronauts, and on a stand by the window rested a model of the proposed space station. Five feet away from me sat the first American in orbit, and he wanted to know what *he* could do for *me*.

"Well," I said, desperately trying to remember my prepared spiel, "I'm a science fiction writer, and I'm here to ask you some questions about your orbital flight."

He smiled, perhaps relieved that I wasn't a lobbyist or a constituent out to win his support for some new legislation. Even so, he said, "There's an awful lot of information about it already in print, I'm afraid." I could read between the lines: he wasn't going to rehash something I could just as easily have gleaned from a library.

"I've already read it," I told him. "What I'm after is a little different. See, I write fiction, and I'm working up a story about what *might* have happened up there, rather than what actually did."

He nodded. "And what sort of 'might have' do you have in mind?"

"I'm thinking of a first-contact story. Specifically, I got to wondering what might have happened if the specks of light you saw swirling around your capsule were actually intelligent aliens."

He looked for a moment as if he hadn't heard me. His expression of polite interest never wavered, his eyes didn't shift from mine, but it took him a few seconds to respond, and when he did it was only with, "And?"

I pushed on, hoping I wasn't losing him already. "Well, what if they showed up because they knew you were in trouble, that your heat shield had separated from the capsule and you weren't going to make it through re-entry? I figured I could write about them actually repairing the heat shield for you, but swearing you to secrecy until humanity was ready for contact with galactic society. I figured that could explain your going into government, since you'd naturally be trying to push us along so you could see it happen in your own lifetime, and—"

"That's a pretty hackneyed plot, isn't it?" he asked.

Now it was my turn to take a few seconds to respond.

He didn't give me time. Leaning back in the chair, he said, "I mean, the benevolent aliens helping out the backward humans, who wouldn't have made it on their own, but in the same breath they tell the humans they'll have to make it the rest of the way without help because interference would be unethical. That sort of thing belongs on 'Star Trek.' No, if you want to write about the fireflies,

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try something a little more believable."

"Such as?" I asked. At the moment they were the only words my deflated ego would let past my lips.

The minute I'd spoken, I realized it could sound to him as if I was being sarcastic, but he just smiled and said, "Oh, I don't know. Why not make them hostile instead? Maybe they were trying to pull *off* the heat shield, trying to sabotage the space program and keep us on the ground."

"You're kidding," I said. "You'd go for a story like that?"

"Why not? It would explain a lot of things. The official story that the automatic attitude controls malfunctioned and burned up all the maneuvering fuel—what if it was actually me using the jets to fend them off? And before that, on the way up, the pogoing up and down wasn't just the rocket flexing, but maybe the aliens were putting some kind of force field in my way and I was smashing through it."

"Force field?" I asked weakly.

"Right. Say they store up inertia from their reactionless drives, and they can direct it against us. Only our enormous size difference makes it possible for us to withstand it."

I'd been in plenty of brainstorming sessions, those free-for-all discussions where people toss out ideas right and left, bouncing them off each other until it either comes together into a coherent story or else goes so crazy it all flies apart. Glenn's words sounded like he was brainstorming, but his tone of voice and his attitude were all wrong. He was zeroing in on something with the single-minded purpose of a fighter pilot going for the kill.

"See, that could explain Carpenter's flight where he had the high-powered attitude rockets. And of course a bigger alien offensive would explain why he used up even more fuel fighting them off, and their inertial weapon would explain why he came down 250 miles off target."

"Uh, Senator?" I said. "I'm sorry, but I'm afraid it would never work."

"Why not?"

"Nobody would believe it, to begin with. If there were hostile aliens in space, we would never have sent up more capsules, at least not without some kind of protection. I mean, the very next flight, Wally Schirra just drifted for six orbits. He wouldn't have done that if—"

"How do you know he just drifted?" Glenn asked softly, and the tone of his voice stopped me cold.

"What do you mean?"

"I mean maybe he was swatting fireflies the whole time. How would you know?"

"Swatting fireflies?" I asked.

"Figuratively speaking, of course." He leaned forward over his desk. "What I'm saying is maybe we beat them. Just because aliens are hostile doesn't mean they're *tough*."

Then he smiled such a big, warm-hearted smile that I momentarily forgot where I was and relaxed enough to think. Even brainstorm a little. "OK, so we beat them. Scattered plutonium dust around, or who knows, maybe just free oxygen was enough to kill them. And then we went on

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with the space program as *if* nothing had ever happened?"

"Of course not," he said. "We tried to find out where the heck they came from. There were probably more of them, you know. We were already headed to the Moon, so we kept that program on track, but we also started sending probes to Mars and Venus. And the outer planets as well, but of course that took longer."

"All in secret?"

"Of course not. We did it all right out in the open. We just didn't advertise *why* we were doing it. Let the public think it was all for scientific reasons. Why panic them into thinking we were under attack?"

"But—" I started to protest, but he cut me off.

"Then of course they *did* attack again. *Apollo Thirteen* almost didn't make it home. *Fourteen* had trouble, too, but the crew was expecting it and they were able to fight them off without much trouble."

I was shaking my head again. "No, I'm sorry, it just doesn't hold together. It's too preposterous."

Glenn shrugged. "Maybe so, but if you want to write about the fireflies, that's the story you should write."

Once again, his tone of voice was absolutely earnest.

"You're serious, aren't you?" I asked.

"Never more."

I resorted to a familiar cliché: "Why are you telling me all this?"

He shrugged again. "What does it matter? Like you said, nobody will believe you. Especially if you manage to get it printed in a science fiction magazine." He laughed. "Which is highly unlikely, of course. The editors know all about it, and they've probably seen the same story a thousand times already anyway. I'm sure it's leaked out from dozens of sources over the years. I've even read about it in the tabloids."

I nodded. "Just like the infamous 'captured UFO' incident back in 1946."

He was still smiling as he said, "Ah, well now, that's another story. The electromagnetic pulse from an aboveground nuclear test got that one." He glanced at his watch. "But I'm sorry, I'm afraid I don't have time to go over it with you." He stood up, and so did I, then he ushered me toward the door. "Thank you for dropping in, and I do wish you luck with your story. I'll be looking for it."

"I'm sure you will," I said, and this time I didn't care if it sounded sarcastic. I glanced at my own watch; it wasn't even eleven yet, but I knew there was no point in protesting. Senator Glenn had told me everything he was going to. In fact, he'd told me more than I'd ever hoped for.

More, certainly, that I could use, if he was telling the truth.

JERRY OLTION
P.O. Box 302736
Eugene, OR 97400

Dear Mr. Oltion:

Not bad. I can see you've done quite a bit of reading between the lines. But you missed one important angle. The Russians were there first; what if they did meet the aliens as in your original "Star Trek" scenario?

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Remember, we were practically at war with the Soviet Union at the time, and if the aliens made friends with the Russians then they would almost automatically be our enemies. That, too, would explain a lot, wouldn't it?

Good luck with the story.

Sincerely,

JOHN GLENN

United States Senator

P.S. My desk is teak, not oak.

Stan:

OK, me here again. Now you see why I submitted it to you the way I did. This is the only way I could imagine salvaging the story, and even so I'm not convinced it'll fly. Maybe if you print it as a fact article?

Let me know what you think. In the meantime, I'm going to get back to work on my next story, an even more daring exposé about the face and the pyramids on Mars. (Yes, I decided to try it even though Ben Bova already did a Martian conspiracy story. Mine will be completely different, guaranteed.) I've just got one question: Will *Analog* cover the cost of a plane ticket to Ithaca so I can interview Carl Sagan?

JERRY ■

Editor's note: Senator Glenn's office disavows any knowledge of the above story and/or its contents.

The patriarch showed his sons a pile of sticks. He took one up and snapped it almost effortlessly. Then, he bound a bunch of sticks together, strained mightily, and was unable to break the bundle. "See?" he said. "Each stick by itself can be broken easily, but if all sticks stay together, then they can't be broken. The same is true of us."

The sons considered; then one said, "But how do you get to be the head stick?"

Kelvin Throop III

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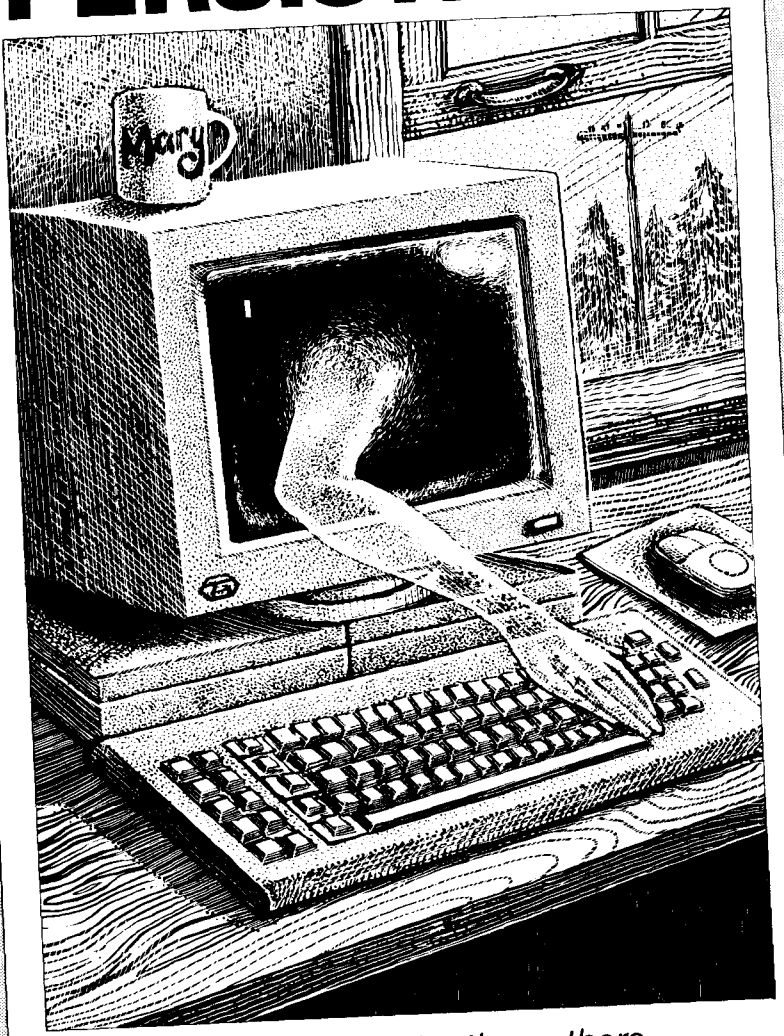
Bud Sparhawk

PERSISTENCE



Some folks die harder than others. . . .

Illustration by Todd Cameron Hamilton

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Did you ever think of what immortality would mean? I'm not talking about the religious meaning of immortality, you understand. I mean the day to day eternal persistence of your presence in the course of human events.

For most of us, however, the only form of immortality we'll achieve is through our children; those genetic monuments we build, nurture, and launch into the future. At some base level our heritage will go on, encased in ragged jeans, no doubt.

Sure, some of us achieve some sort of immortality through our accomplishments that will guide, influence, and move generations unborn. Le-Corbusier's designs will continue to influence people for a few more centuries, von Neuman's computer legacy will last longer, and Einstein's astounding insights will hold our interest for a millennium. I could bring up old Bach's achievements, but that would be too embarrassing to everyone else.

Then there's the great deeds category with such notables as Jesus, Mohammed, Buddha, and assorted philosophers and statesmen whose memes permeate our society to such an extent that we aren't even aware of their influence. Some are recognizable, most are not.

Notwithstanding that, most of us dwell, at one time or another, on the fourth kind, the prospect of living beyond our normal span of fourscore and five, not as some abstract monument but as living, participating members of humanity's struggles. Some of the more sensible of us lose these thoughts when we approach middle age and face up to the reality of what we are and what life holds out for us.

Personally I just can't see the joy of slogging through eternity a day at a time, having to spend 80 percent of your waking hours sweating and flogging for food, shelter, and clothing. Maybe you could change jobs every twenty years or so, but how long would the joy of doing something new last? Not long, I'll bet. Of course, we'd all like to think of ourselves as being particularly blessed: Were we to be immortal we could corner the market, invest in real estate, amass a fortune.

Listen, friend, if you could do that as an immortal, you could do that with what you have. So how have you built your fortune today? Where is your edge on the market? Where is that cheap piece of property you bought that's now worth a fortune? OK, get the picture? Most of us are pretty dumb and have to struggle to get along, just as we would if we had all of the longevity in the Universe. There ain't a large market for immortals as a commodity, Mel Brooks's thousand-year-old man notwithstanding.

So why this universal urge to outlive our mortal span if it just means more of the same thing? I don't think it has as much to do with personal aggrandizement as it does simple curiosity: Everybody wants to turn the page and find what lies ahead. I think this goes back to our ape ancestors who always wondered what was in the next tree, was the next water hole better, or if Og's mate is as good as your own? Yeah, curiosity. That's the

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bait in the immortality trap, and one that we all fall into. Hey, it's our nature! We're born curious and die the same way. Who knows, when the end is near most of us won't fear where we're going as much as regretting what we're leaving behind. I'll bet that most would go with a smile on their face if they *knew* that they'd be able to keep track of things afterwards, and not have to pay for rent or food for the privilege. Sounds like a good deal to me.

There's a scene in Thornton Wilder's *Our Town* where the folks in the cemetery watched and commented on what was taking place down in the town below their hill. I particularly remember the older residents telling the newcomers that their interest in such trivial things would pass; they'd come to realize that it just didn't matter any more. Maybe they expressed what we all fear about dying—the idea that we might just give up caring and surrender our curiosity about the world of the living. That would be a profound loss of the single human quality we all seem to share.

So the two important things about immortality are our ability to influence others and keeping track of events, and not the preservation of the body. I'll leave matters of the spirit to the theologians.

Mary was attractive, not because she was a raving beauty but for her charm; a few moments of conversation and appearance wasn't an issue. She had that precious ability to be able to laugh at herself, the world's foibles, and to show others the humor. Whenever we had lunch together, which was something more rare than I really would have preferred, she would bring me up out of my normal cynical shell so that I achieved what for me was almost an optimistic look on life.

I knew Mary from college. While I was studying journalism and planning to be a big shot reporter, White House, maybe, or a pundit whose every word moved the rich and powerful. Mary was in some of my English classes, required for all sociology majors. She was a cute little button-nosed blonde who was ever surrounded by a crowd of friends. I pegged her for sorority material, very social type, and dismissed her as a cipher in the world's schemes. Naturally I, who had few friends and had a tough time striking up a conversation even with my mother, for God's sake, got thrown together with her for some stupid paper—a course in collaboration, the prof kidded. I thought I'd end up doing all the work for this tiny, depressingly cheerful creature. In those days black was my favorite color—hair, shirts, pants, shoes, the works! It was a reflection of the cynic in me and a harbinger of the vicious depressions that were later to be my burden in life.

But she surprised me with her enthusiasm and discipline, so rare in those I had tried to study with in my short time at university. Needless to say I was floored with the way she pitched in and argued with me. I had no idea she would accept me, the lump of Eng Lit 101, as a friend. We

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did the movie thing with shrieks and pizza to celebrate the day we turned in the result. That's when we decided on a concerted effort to be friends—lunch once a week to keep in touch with each other. That habit lasted for years—even though we both moved several times after grad school. The conversations at those lunches always left me feeling that there was some reason to go on living. Usually it was a joke or some funny story she'd heard. Mary was a great one for passing along someone else's jokes.

Mary found out about her problem in her senior year. Dr. Gehrig's disease, amyotrophic lateral sclerosis. Terrible thing to tell a bright senior who's her whole life before her; she'd be lucky if ten, fifteen years to go before she died—there were no cures, no therapies. We binged on pizza and beer that night, and the next day I drove her home so she could tell her mother. Her father had been killed in a hunting accident a year before so her mother was a bad double dose. I stood helplessly while the two of them wept and cried. It was just another example of how rotten life is. I remember thinking nobody gets a break.

But after the crying was over Mary moved back into her life. The thought of her impending doom didn't seem to dampen her enthusiasm for life in the slightest. To hear her—of thinking, as she carefully explained to me time and again, she had had good years and a few bad ones but—she why not make the best of them? We all, she said, have our whole lives to live. What matter how long or short—it's the quality that counts. I nodded agreement even though in my heart I knew it wasn't true. No matter how we felt at that age it was certain that she couldn't count herself among the immortals. I'd have said that life sucks and jumped off the nearest bridge.

Her first job after graduation was with a survey firm who wanted a cheap statistician. Sociology doesn't qualify you for many jobs, but statistics is one tool every one major learns backwards and forwards. Besides, it was better than flipping burgers or driving a cab, her only other options. I, on the other hand, stepped right into a prestigious journalism job—running copy for a regional business journal with a promise that I might, just might, be able to cover a story on occasion, but right now would you run out for some more coffee? Our combined wages were barely enough to afford a sit-down lunch on our once a week meetings, even so we still exchanged the occasional birthday or Christmas present—shoddy and cheap things for the most part, but the best we could afford at the time. Once I gave her some perfume that was so powerful when it hit her skin that you could smell it a block away. "What's it called?" she'd asked. "Obsession," I replied instantly, sending her into a fit of giggles that bent her double, gasping for breath.

I remember the first time she worked with a desktop computer, as we called them in those quaint old days, a wordfully underpowered 8086

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running at less than a snail's pace. They took away the rental terminal she had been using—told her she could run down to the data center for the big jobs if she had to. For days after they put the PC on her desk she kept expecting a notice from the mainframe priests to appear on the screen that the system was going down. The company also bought a little statistics package for her beast. She told me that it sometimes took over an hour just to run a simple correlation.

But, as the state of the art progressed they kept upgrading the system. Her machines got faster and smarter as she progressed through the -X86 series of chips, until she was finally able to do nearly everything on the PC instead of paying homage to the Mainframe Gods. The day she got SAS up and running on her desktop machine was a revelation. She was so wired when she met me for lunch that nothing would do but we had to pick up some sandwiches and camp in her office while she showed me the operations her little machine could now handle. Unfortunately the progress of her disease was in inverse correlation to the progress of the computer culture. Her body shriveled, her muscles weakened, and moving became a real burden. But her spirit remained undaunted. She still carried on an active social life and was always around people, a welcome addition to any crowd. Her main problem was overcoming the reluctance men had to approach her, talk to her, and get past the initial sensitivity—theirs, not hers. It was obvious to me that she'd never have the marriage and kiddies routine with that problem: *No contribution to the genetic pool from her,* I thought, and cried for her that night.

She figuratively dragged me, since I had to push her wheelchair, into her office for a mind numbing display a year later when Systat introduced three-dimensional graphics that you could rotate and tilt. It let the analyst see relationships they would never find in a columnar listing. She had worked until midnight the day that demo package had arrived, seeing what the new features could do for her. Luckily I had landed a position with one of the computer trade journals by that time and was starting to acquire a fair understanding of these systems. Even though I couldn't understand the stats the way she did, I could appreciate the power of what she was showing me.

From then on she had to have the latest and greatest in software and hardware. There was no stopping her; whenever the company could afford it, or when she could con some hungry vendor looking for an opportunity to contribute, she got more capability. I think she'd got up to the Wave package, which really needed a workstation instead of that accelerated, multi-carded, co-processored, feature-crammed monster she had assembled on her desk, before her disability forced her to leave.

As I said earlier, her disease was a particularly nasty piece of business. Instead of hitting you hard and fast it develops slowly over a period of years. Gradually, oh so gradually, it robs you of your motor abilities, your

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coordination, your fine skills of finger and tongue, without harming the things that keep you alive and your mind active. In the last stages, before the lungs and heart grow too weak to maintain life, there is nothing you can do for yourself except lie there and wait for the end; day after day after day.

But there was something about Mary's spirit that wouldn't let some failure of her body dampen her enthusiasm for life. She had kept up the commute until she couldn't make the long trek to the office, one of those suburban brick monsters sitting four miles away from the closest parking place. Even then she didn't give up. She swung a deal with the company to have a computer installed at her place so she could telecommute. I helped her put in the modem and the extra telephone lines, and saw the sparkle in her eyes when I told her that she could talk to anyone with a similar setup, not just her company. From her reaction I knew that she would explore this possibility.

Actually it took about six months for her to get to the networks. Up until then it was bulletin board after bulletin board, ever expanding her circle of friends. She downloaded everything she could find, and threw most away; she wasn't into games, and development tools were just a means to an end, not something to be hoarded like priceless jewels.

Once she hit the Internet things really started flying for her. Suddenly she could talk to anyone in the entire world, and help researchers continents apart with her statistics. By then her work situation was that she did piecework only, freelancing on the side for fun and profit. I think she was mentioned in more than one paper as a collaborating researcher. On a normal evening she had fifty or so messages in her in basket, and responded to every one as fast as she could. She once told me that she was following threads in about a dozen forums; subjects ranging from anthropology to astronomy, from literature to cures for humanity's most egregious stupidities. In all she was a bright spot, ever one to spread the calming balm on some flashing flamer, or rev up a lagging dialogue with one of her jokes.

Because of her confinement the computer became her most important link to the world. Sure, her many friends still came by on occasion. I continued to make our weekly lunch date, for example, always waiting for her call to set the day. My schedule, now that I had a column, was flexible enough to accommodate hers. Every once in the while, her birthday or Christmas, I'd bring her a small present, a token of our friendship. I tried to keep our talks light, telling her about the newest advances I'd seen at the trade shows or at some vendor seminar, and learning that her grasp of where the technology was going often exceeded my own. One day I listened to her tell me about the Queen Bitch at the hospital who was complaining about everyone else's computer incompetence. "Ought to get her a scratching post for her office," I remarked, eliciting another fit of giggles from Mary. They were weak

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wheezes, but laughter nevertheless.

Eventually even pressing the keyboard became too much of a burden for Mary's weak fingers. She couldn't hit the keys with the speed and accuracy she needed to keep up with the workload she had generated for herself. I helped her install a small utility program that grabbed her incoming e-mail and generated the response, sans text. That way all she had to do was peck out what she wanted to say and send it. I figured we saved her half of the keystrokes in doing that. Little did I know that much of what I said was going straight into a data bank, with a decidedly Mary-ish touch, to be sure.

She had a better understanding of the implications of her disability's progress than I. Over the next few months she painstakingly put together a file of her favorite responses; sentences for the most part with an occasional paragraph and lots of generic phrases. The file was coded so that she had only to tap out a string of numbers on the chord keypad, something she'd acquired from the local medical disability SIG, to pull an entire message together. She had crafted her file so carefully that I doubt that one could tell which message was typed directly and which was composed with her data base. Later, when even the chord keypad became too much to handle, another friend tied her keyboard to a blow tube so she could type with little puffs of air, but I'm getting ahead of myself.

Mary's agent idea was something that she worked up through some of her correspondents in Canada, France, and here in the good old US of A. They cobbled together the worst mess of object code that you ever saw. No structure to speak of, just modules of varying sizes here, there, and everywhere in at least three computer languages at different levels of the system architecture, and two types of data bases. There may even have been a neural net some place in there. I know for certain that some fuzzy logic was being used, and I don't just mean the technique! When they were done Mary only had to identify the key words in the incoming message and the agent would pull together the relevent parts from the data base; a joke, a paragraph, a comment, whatever it took to respond properly.

I didn't even realize what she'd accomplished until, on one of my weekly luncheon visits, I noted that her correspondence files had grown to over a hundred messages a day. How, I asked, can you possibly keep up with such a load in your condition?

Her response was one of those damnable smiles and a spasmic jerk of her head in the direction of the screen. I hadn't noticed that the modem was active when I came in, all six lights glowing bright red in the crevice between her computer and the printer, like the eyes of some demon. I watched the screen scrolling line after line, not a message but an on-line conversation was taking place before me. I saw the sign over from the other end and, to my amazement, watched Mary's response ap-

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pear on the screen. I looked at her contorted and still body, wondering how she was doing this wonderful trick and got nothing but a smile in return.

"My agent . . . working for . . . me," she said, grunting the words out painfully and slowly. By this time the deterioration had progressed to her throat muscles. "Analyzes what's said . . . composes what it . . . thinks I . . . say. When . . . guesses wrong I . . . wink," and she blinked her eye. The screen stopped typing for a moment and then continued. I think it was taking a new track. Yes, it was saying the same thing, but in a different way.

That was when I noted the gadget on her glasses. It was one of those new ones that picks up movements of the eyes and translates them into commands. When Mary saw something she wanted the agent to "say" differently, she just winked. "Ten second . . . delay . . . transmission . . . allows me . . . stop saying something I . . . regret. Made our lunch date . . . agent did." There was that Mary smile again, distorted by her problems, but still brightening the room.

So her team of experts, friends around the world, had built something that acted like a canned Mary, and to which she had added her enormous data base of sage advice and quips. Even without her corrections you would be hard put to discern the difference between a real conversational exchange with her and her little agent. Of course it wouldn't pass the Turing test, but most of what goes for conversation of the net couldn't pass that test either—most people would suppose that *everything* was being written by machine!

That's when I realized that the joy that Mary got from her communications was not from the act of writing but the simple fact that she was still, despite her problem, connected to the world, and sharing in its joys and sorrows. As long as she was on the network she was celebrating life.

I later discovered that her correspondents were in every major country on the globe, every university, and on most of the commercial nodes. The variety of people who contacted her just to say hello, share a funny story, or tell her some snippet of news was enormous. Those items that were of special interest were placed into her data base, ready to be called out whenever the right key word was mentioned in some other conversation. In time, Mary's data base became very much like her: a pack rat's assembly of miscellaneous facts and associations that reflected her active and inquiring mind. It was convoluted and idiosyncratic, just the thing that makes a good conversationalist.

I wasn't there when the end came. I suspect it was in the middle of the night, for her nurse found her the next morning lying peacefully still, a ghost of a smile on her face. Her special glasses were lying nearby, close enough to have fallen from her face.

There was a modest little ceremony at the funeral home, one attended by nearly a hundred friends and associates. Much to my surprise

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I found that some had come clear across the country to pay their respects, so taken with her were they. The flowers from far and near were overwhelming. I had no idea that she had touched so many lives. By the time the service was over and everyone had spoken their piece, I was in such a black pit of despair that I half felt like laying down in the grave and letting them shovel the dirt over me. But then I remembered the deadline my boss had set and decided to head back to the office. He'd pursue me into hell to meet that deadline, I was sure.

When I got back to the office I found a message from her waiting on my computer. The text asked me to contact her since she couldn't make our lunch date. My finger was nearly on the key that would delete the message when I noticed that it had been sent just an hour earlier, after the crowd had left the cemetery, about the time the gravediggers would have finished filling Mary's grave. For a moment I had one of those horrible weird feelings and then remembered her agent. She must have left a reminder tag in her machine to call me about our weekly luncheon and that agent of hers must have executed it. Always anxious to close the loop I responded as requested, expecting to see some standard response.

Instead I got a bright greeting from Mary, asking about my day and telling me a funny story about Brian's cat. Brian lived in New Zealand and was one of her faithful electronic companions. He was the one who had sent the huge bouquet of roses to the funeral home. There was a warm, comfortable feel about our dialogue; it was almost like talking to Mary herself, the old Mary prior to the slow, halting, and slurred speech. I typed in a few nuggets about my day, giving it the edge she always chided me about—and the damned agent responded just as she would, warning me that my depression would eventually drive me to suicide, provided one of the targets of my more acerbic columns didn't shoot me first. It was a classic Mary barb.

I stayed on the link for an hour, often forgetting that it was just a silly little program and data base that I was dealing with and not my old and dear friend. And when I did remember, it made little difference, it was a piece of her own self that I was touching. It may have been a pitifully small fragment, but it was the essential Mary, and even a little part of her joy in life and interest in people went a long way. I wondered why no one had turned off her machine when she died, but was glad they hadn't: otherwise, I wouldn't have had the wonderful grace of this conversation. It eased my sadness at her departure from this bleak and horrible world of ours. It gave me the courage to live one more day.

The next morning I had a long conversation with her brother and bought all of her computer gear for a fair price, which is to say that neither of us was much satisfied. I took it home, had a special line installed, and brought up Mary's program. I was astonished to find out how many of my cynical, sarcastic, and pointed jokes

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were on file, how many stories about work and life in the city were included, and how many times my own name was mentioned. I'd never considered the impact I must have had on her, so focused was I on my own needs. Mary had both of us in the data bank, friends forever.

Now that I'm a full-time editor and have a cadre of galley slaves to do my bidding, I can easily afford the telephone and network charges. It isn't much compared to the pleasure I get out of seeing her messages roll in and out, keeping the data base full and her correspondents happy. Oh, I did add the fact that Mary died to the data base, but for some reason that single paragraph never seemed to be accessed.

So there you have it. Every day she's out there, in the net, helping people, talking the trash, listening, and giving her bright bit of the joy of life to anyone who will listen, and giving back far more than I could ever hope to achieve. You may have spoken to her through the e-mail link today, one of a jillion messages spanning the globe. You may have downloaded some of her advice—a gem from her files—or seen comments in some forum thread on a node in someone's basement office or deep in the recesses of a giga-megabyte storage facility. You may have brought a piece of her, a quote or a story, into your machine on some disk, or touched her when you casually reviewed some thread on a forum or a BBS.

I know that somehow there are pieces of her flowing in the networks; that as long as I can keep the agent going some small part of Mary will have achieved immortality of a sort. Mary never had the opportunity to have children, never had a chance to build a monument, and didn't even last her normal span. But her agent is a legacy of some sort and it will go on long after her physical body is gone the way of all flesh.

One day I might find someone who can figure out how to launch her into the net so she can continue long after I'm gone. Who knows; when man finally gets off his apish ass and starts building a truly star-spanning network, a part of Mary might still be around, greeting the aliens, sharing her dreams and hopes. I sincerely hope so, because she'll be pulling parts of me along as well. Until then I intend to keep her machine operating and linked into the network. It's something that keeps hope alive in my deepest soul. ■

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BIOLOG Jay Kay Klein

A Beltway Bandit for the past twelve years tangling with corporations, government, and the military, Bud Sparhawk joined the U.S. Air Force following graduation from the University of Maryland with a B.S. in theoretical mathematics. Trained in communications-electronics, he ran communications stations for some years and then transferred to intelligence work. He left the military as a captain directly after receiving an MBA in finance from Oklahoma City University. Bud went back to his native Maryland after having lived in France, England, Japan, and various American localities. Raised in Baltimore's tough West End, he now resides outside Annapolis, which he considers the sailing capital of the known Universe.

As a communications and information systems architect, he does consulting for government, military, and corporate clients. Free days see him in his 23-foot sloop. He writes or reads science fiction at night. Bud fell under the spell of SF in 1949, and has read every *Analog* dating back to 1938.

The urge to write came when reading Harlan Ellison's story notes in *Dangerous Visions*. Bud wrote some 35 stories in two years, with *Analog* first publishing one in the August, 1976 issue. A second sold for the January, 1977 issue. Graduate school and learning to survive in a ruthless business world made him stop writing until 1992, when a real-life story about Bud, his sailboat, and hurricane Hugo saw print. Ten SF stories got him back into practice, with the eleventh appearing in the May, 1993 *Analog*.

Ideas strike during sailing, while thinking about recent scientific articles. Writing furiously later, he often amalgamates several originally sepa-

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Bud Sparhawk

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THE ALTERNATE VIEW: John G. Cramer

SEARCHING FOR MACHOS

On a mountain top on a clear moonless night the brilliant stars strewn across the sky press down almost oppressively, the Milky Way so full of them it seems about to burst. And yet, we have been learning in the past decade that the visible matter of the Universe, the stars that we see, represent only a tiny fraction, perhaps less than one part in 200, of the mass of the Universe. The question of what the remainder of the Universe is made of is called the Dark Matter Problem. It is one of the most vexing in modern physics.

Since the dark matter problem came to prominence in scientific thinking there has been no shortage of speculations as to its origins. Theorists have suggested that the extra mass might be in the form of massive neutrinos (see my AV columns in the 12/91, and 9/92 issues of *Analog*), axions (see my AV column in the 2/85 *Analog*), weakly interacting massive particles or WIMPS (see my AV column in the 5/86 *Analog*), or a host of other could-be particles. One unresolved possibility is that some part of dark matter could be simply an excess of normal matter in non-luminous forms. Cometary halos, Jupiter-like planets, and small dim stars may be more numerous than we estimate. This possibility presents a problem: if there is more non-luminous normal matter in the Universe than expected, how could it be detected?

Fortunately, there is a feasible detection scheme. When light passes near a massive Jupiter- or star-size object, it will be deflected slightly by the object's gravitational field. If the alignment of object, light source, and observer is a perfect straight line, the "gravitational lens" formed by this deflection produces a ring image called an "Einstein Ring" (see my AV column "The Rainbows of Gravity" in the 11/88 *Analog*), a halo of light centered around the imaged star. Such perfect alignment is very improbable, and only a few Einstein Rings have ever been observed.

A much more probable scenario is that a massive non-luminous object might pass close to the line-of-sight to a distant star and brighten its pointlike image by deflecting more light toward the observer. This phenomenon is called "gravitational mi-

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cro-lensing," and it can brighten a stellar image by up to a factor of 10 or so if the conditions are right. Micro-lensing can be used to detect the presence of a massive non-luminous object as it brightens for a time the image of a background star in passing across the line of sight.

There are, of course, many other reasons why a star can become brighter: eclipsing binaries, Cepheid variables, solar flares, novas, supernovas, etc. The signatures of a micro-lensing event, as opposed to these other phenomena, are that (a) it will be independent of the type of star brightened, (b) the light-increase curve must have the same shape on the rising side and the falling side of the curve, (c) the expected time duration of such stellar brightening should be on the order of a few days to a month, and (d) the increase must be the same in shape and magnitude at all light wavelengths.

Gravitational micro-lensing events are expected to be relatively rare. It is estimated that at any given evening of observation, the image of only about one star in two million will be observably increased in intensity by gravitational micro-lensing. For this reason, it is necessary to scan the images of a very large number of stars very efficiently in order to have any reasonable chance of seeing this phenomena.

Three separate groups of physicists and astronomers have been seeking dark matter objects using the gravitational micro-lensing technique. These groups are the MACHO collaboration in the USA and Australia, EROS in France, and OGLE in Poland. MACHO is an acronym for *MA*ssive *C*ompact *H*alo *O*bjects, and EROS stands for *E*xpérience de *R*echerche d'*O*bjects *S*ombres, all of the groups perhaps distinguished by their politically incorrect acronyms.

I don't have the space to discuss in detail the techniques used by each group to observe the brightening of background stars, so I'll focus on the method used by the MACHO collaboration. They have decided to use the stars of the Large Magellanic Cloud (LMC) for their background because it is a relatively dense population of stars viewed through the halo of our own galaxy. The LMC is only visible in the southern hemisphere, so the collaboration has rehabilitated a venerable 19th century telescope, the 1.27 meter refracting telescope at the Mt. Stromlo Observatory in Australia, for their MACHO search. On each night with good "seeing" they scan the LMC in pre-programmed blocks using two very large charge-coupled-device imaging systems with about 16 million pixels each; one observing blue wavelengths and one observing red. On a good night of observation they record about 4-5 gigabytes of star-image data, which are then processed with sophisticated imaging software to identify star images that change in intensity. As of September 15, 1993, they had recorded over 12,000 wide-field images with the electronic imaging system. So far they have been concentrating on images near the center of the Large Magellanic Cloud, scanning about 1.8 million stars and analyzing about 250 im-

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ages of each star taken over a period of one year. The EROS and OGLE groups use more conventional photographic plate imaging systems, with the photographic images then scanned and analyzed with computer software.

The October 14, 1993 issue of *Nature* presented the first results from the MACHO and EROS searches. The MACHO group reports what appears to me a definitive micro-lensing event. A magnitude 19 star in the LMC (believed to be a "clump giant" metal-rich helium core burning star) shows no variation for most of the year of observation, but during a 33.9 ± 0.26 day period it shows an excursion in which the light output is increased by a factor of 6.89 ± 0.11. The event has the characteristic shape predicted for a micro-lens event, and shows this shape in both the red and blue imaging systems with the same magnitude, time position, and time width. The group has also observed 10 other less striking events that show light increases by a factor of 1.3 or more.

In the same issue of *Nature* the EROS group reports their results. They have been monitoring 8 million stars in the LMC over a three year period by taking 304 plates with red or blue filters in a 5° × 5° field of view, using the Schmidt telescope at the European Southern Observatory at La Scilla, Chile. The EROS group is also conducting a second program involving fast electronic imaging for seeking microlensing events with a time scale of hours or days.

The EROS group reports two candidate events observed for background stars in the LMC, one showing an increase in brightness by a factor of 2.5 ± 0.3 and a duration of 27 ± 2 days, and the other with an increase factor of 3.0 ± 0.6 and a duration of 30 ± 3 days. The data for these events are well fitted in both the red and blue images with increased curves predicted by micro-lensing.

The EROS group also reports partial observation of the event reported by the MACHO group. The image of the star of interest is too weak for analysis using their blue plates, but it shows the reported characteristics in their red plates. The MACHO group, unfortunately, was not able to confirm the EROS results because one of the EROS events occurred outside their observation period and the image of the other EROS event fell in a gap between their CCD detectors. In a recent issue of *Acta Astronomica,* the OGLE group in Poland has also reported observation of an apparent micro-lensing event with an increase factor of 2.4 and a duration of 24 days observed in a background star in the "bulge" of our own Galaxy.

Because the massive object that has produced a micro-lensing event is not observed directly, estimates of the size of the object are correlated with estimates of its distance from the observer. For this reason, only a rather broad range of possible object masses can be extracted from the observation of individual microlensing events, no matter how good the data is. The MACHO collaboration estimates that the mass of the object pro-

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ducing their event, as inferred from the size and duration of the event, is between 0.03 and 0.5 times the mass of our Sun, with a most probable value of about 0.12 solar masses. For reference, Earth has a mass of 3×10^{-6} solar masses, and Jupiter has a mass of about .001 solar masses.

A star with a mass of 0.12 solar masses is not, strictly speaking, a "dark matter" object. For example, one of the stars in our galactic neighborhood with a mass of about 0.12 solar masses is Kreuger 60 A, a class M4 star about 12.8 light-years from Earth. It is rather dim because of its small mass, with a visual magnitude of 9.7 and a net light output only about 0.17% that of our Sun. We can observe Kreuger 60 A only because it is close. If it were about half way to the LMC, as is the MACHO object observed, it would not be visible. The significance of the gravitational micro-lensing technique is that, given sufficient statistics, it allows astrophysicists to "take the census" of objects in the halo of our Galaxy that are too dim to be observed with conventional astronomical techniques.

The three groups mentioned above are so far observing micro-lensing events at a rate expected if the extra mass in the halo of our Galaxy deduced from the velocities of bright stars there were accounted for completely by MACHO objects, i.e. dim clumps of normal matter. It is also consistent with estimates from Big Bang cosmology of the density of normal matter required to synthesize deuterium, helium-3, helium-4, and lithium-6 in the early Big Bang. However, so far only a few events have been observed. Much better statistics will be required before meaningful conclusions about cosmology and the dark matter problem can be drawn from these data.

Even if these early indications are supported by better statistics, however, only a part of the dark matter problem would be solved. There would remain the problems associated with the excess of mass present in galactic clusters, the excess of mass required to congeal the Universe after the Big Bang to form the Galaxies and galactic clusters we observe, and the excess of mass needed by cosmologists to reconcile our Universe with the inflationary scenario of the Big Bang, which requires a density eight times larger that the most optimistic estimate of MACHO-contributed densities would imply.

We may have been able to account for one kind of dark matter, but there remains at least a second variety which remains elusive and mysterious. Perhaps part of the Universe is MACHOs and another part is WIMPs. ■

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rate ideas. He reorganizes the text a dozen times until a coherent story emerges. Other writings are about sailing and computer systems. Bud feels that being too scientifically correct can be self-defeating. An interesting story is the main thing and scientific perceptions are subject to change as new data come to hand.

Writers weave stories out of the tangled skeins of experience and knowledge gained under often tough or unusual circumstances. Bud populates his stories with characters based on persons he's met from the Baltimore waterfront of his youth to the corporate and government types trying to cope with a computerized world they don't understand. Off-world humans are not likely to be any less baffled in the future nor less likely to act in ways already well known in ancient Assyria.

Intractable people are notoriously harder to deal with than intractable technical problems. Bud claims his boat is unsinkable thanks to technology developed since 1912. Still, you have to be ready for the Universe to come up with bigger and meaner icebergs. ■

"I think, therefore I am."

—René Descartes

"I think, therefore you are."

—Kelvin Throop, solipsist

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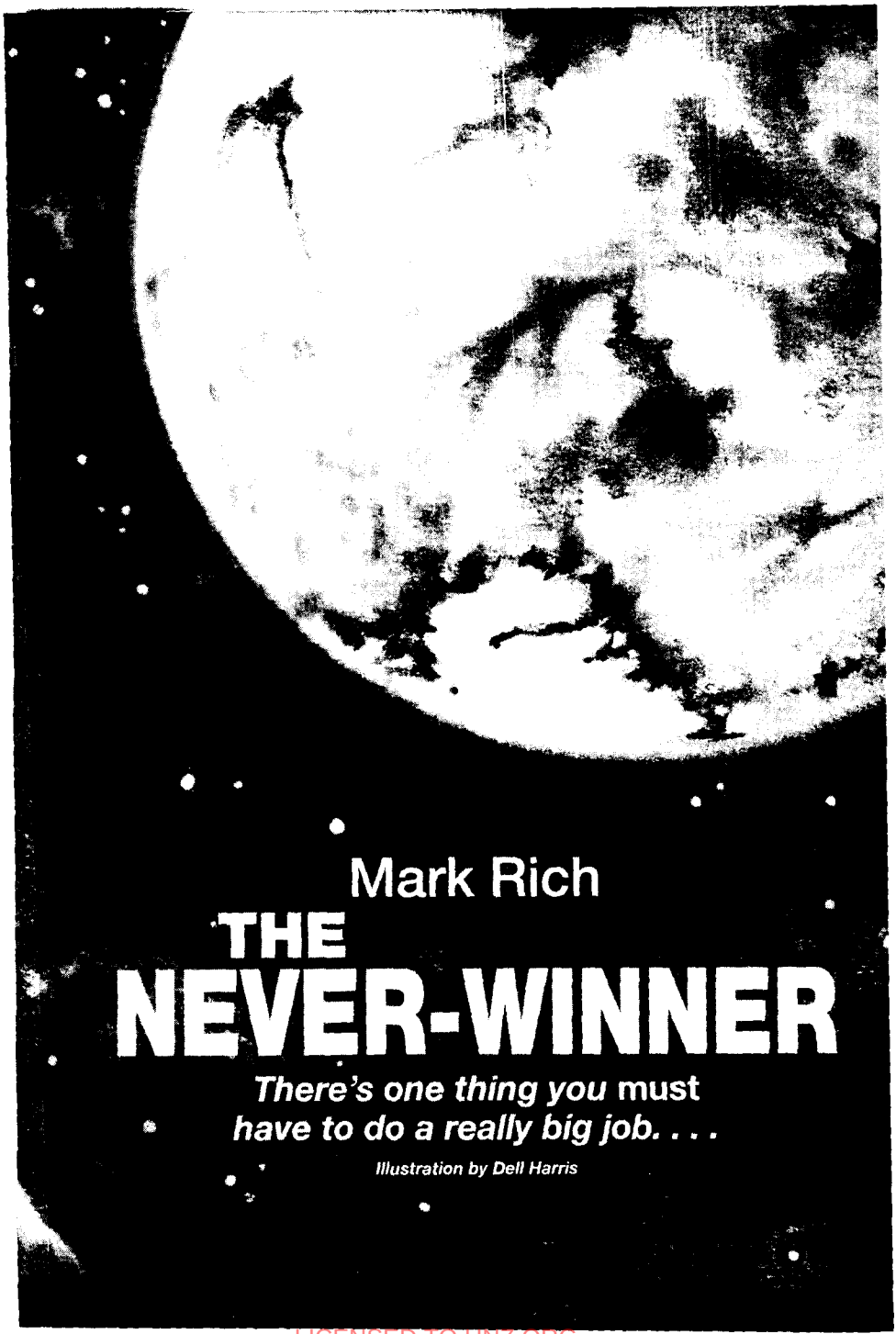

Mark Rich

THE NEVER-WINNER

There's one thing you must have to do a really big job. . . .

Illustration by Dell Harris

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"I really think I should talk to the president," John Monura said to the senator.

Roger Haldings leaned back in his chair and regarded his negotiator with apparent dissatisfaction. The chair creaked under the big man's weight.

"John," the senator said, "it hardly seems that important."

"The *president* thinks so," John said. "The Mars Initiative is right up there with the national economy in terms of importance."

"Just 'cause you hear it in a speech, don't mean nothing." The senator from Tennessee regarded his fingernails. "The vice-president sets up the task force, and that task force has hired negotiators, and you, John, are chief negotiator, although you're starting to carp so much I wonder whose side you're on. The president doesn't really care."

John looked warily at the senator. Threats slipped edgewise into a conversation usually meant the most trouble. The senator had made allusion to his one-quarter Japanese blood as being somehow suspect before.

"Roger," John said, "I'm trying to do my job. On the one hand, it's a reasonable job—I just have to negotiate for financial support from the Japanese, since Congress won't allocate enough money to fund the Mars Initiative 100 percent."

"Right," Haldings said, sounding bored.

"But I face a huge stumbling block. I have no real bargaining power."

"Come off it, John," the senator said, irritation in his voice. "The Japanese *want* to get into the Mars project. We *know* that. You've got all the bargaining chips you need—American know-how and American experience in space."

"The Japanese want to get into *a* Mars project. It doesn't have to be ours."

"Who else is there?" Senator Haldings said. He ticked off the fingers of his hand. "The European community has already decided to wait on any Mars work for at least a decade, and the Russian program is still a shambles, and China has no interest in anything but its satellite program. That's from *your* briefing, Monura. There's no one else offering."

"You left out one."

"Nah. That's all the serious competition, and they're out."

"There's Qatar."

The senator laughed. The chair creaked as he pushed back from the desk. "Forget about them, Monura. Sure, they've been rushing around buying equipment and hiring technicians for their new space center. But it still doesn't amount to beans."

"You don't understand, Senator. The reason Qatar *is* attractive to Sato's team is what they *offer*."

"Sure, money. They've got it, Japan's got it. If they ever *did* get together, they'd have a pile to play with, all right. But *we* have both the money *and* the know-how. You can't beat that combination, Monura."

"I'm not talking about just money. It's the commitment that makes the difference. It's something I can't offer the Japanese, because you won't let

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me!"

Halding's eyes narrowed. "What are you saying, John?"

"Listen. When I go to Sato, all I can offer is the promise of certain things—technical and materials support, organization, and infrastructure. Those *are* pretty strong offerings.

"But when Sato's team goes to ad-Dawhah, they go talk to Dr. Ahmad bin Jabir, and what does Jabir offer Sato? He offers a brand new facility constructed in Musay'id that *isn't* left over from a Moon program and *isn't* left over from a shuttle program and *isn't* left over from boondoggle military programs, but *is* constructed with only one purpose in mind: reaching Mars. Every single person in the Musay'id facility is *new*. The training of every single one of them is oriented around one thing: trying to get to Mars. And those folk are tops in their fields, because the government in ad-Dawhah can afford to hire whomever they want, especially when they hold out the carrot of being on Mars in twenty years!

"But that's only the little part of what Qatar's offering Japan. Jabir's made clear that Qatar is offering a twenty year commitment to the project. *Twenty years.* No change in the funding. A constant funding level of almost a billion *riyals* per year."

"They need a lot more than that," the senator said quietly.

"They do, and they know it. That's why they're negotiating with the Japanese. A Japanese-Qatari partnership would be able to do it, in spades."

"I don't see the importance of this, John," Haldings said. "Really, I don't."

John sighed. He'd known Haldings in his pre-Senate days, and thought he'd lost some of his ability to see beyond the dim walls of government since taking office. "Haldings, what can I offer the Japanese? I can offer the infrastructure at NASA. But can I offer commitment? Twenty years? I can't even guarantee that the level of Mars Initiative funding will stay level for two years!"

"The Japanese understand our political system," Haldings voice barely rose above a rumble. "They don't need to be told that funding requests have to keep going before Congress. They won't see that as a problem."

"They *do* see it as a problem, Senator. The Japanese have already been our partners in a number of space programs, and they've already been burned by our proclivity to pour money into a project one year, and then cut funding the next! The Japanese need assurance of continued support over the long term! They aren't going to invest in the Mars initiative unless they can get a commitment of a significant stretch of time—at *least* ten years. And if this assurance of commitment comes from a high official—the higher the better—*then* I have a bargaining chip."

"Monura, get this through your head. You *aren't* going to the president about this. Period. It isn't so big a point. We've dealt enough times with the Japanese that they understand there are a few trade-offs in dealing with us. But we've got what they want. We've got overwhelming superiority in space support systems.

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There's no one else in our position. You can't deny that, can you?"

"That's what people were saying in September, 1957."

The senator looked irritated. "What happened then?"

"It's what happened in *October*, 1957, that matters. The Russians sent up Sputnik."

Haldings dismissed the point with a flip of his hand. "Let me tell you something about Qatar, John. I've never been there, but I have been to Bahrain, and I can tell you that the rest of the Arab world laughs at the Qataris. In Bahrain there's an aluminum smelter near Askar. When people started fussing about the pollution, you know what they said? They said, 'Ah, it doesn't matter, all the smoke blows down to Qatar.' They don't think much of the Qataris. The Qataris are the slowest people around the gulf."

"But the Qataris—"

Haldings held up his hand. "Let me tell you something else, John. There's an old proposition, goes something like this: a good *little* man never wins against a good *big* man.

"Now you've got all the chips you need to win an agreement with the Japanese on the Mars Initiative. We'll be the first on Mars, and we'll have the first settlement on Mars, John. Because even if the Qatari offer is good, they're the *little* guy. Our offer's good, too, and we're the *big* guy. Qatar is the never-winner. So go sock it to 'em, buddy."

The senator examined his fingernails again, and then ran his thumb over his calendar. The chair creaked as he pulled himself closer to the desk and its assortment of papers.

His time for Monura had obviously ended.

John marched into the hall fuming.

Ryoichi Sato's face hovered in the air over the table, then vanished.

John shook his head, wondering if it would ever clear again. The negotiations told on him: they trailed him here to the cafeteria and haunted the dull yellow tray with its institutional sandwich, salad, and bowl of tapioca pudding, just as they would tail him home tonight and keep him from sleep.

He bit into the sandwich, then sipped iced tea to help wash down the nondescript fare. It had as little substance as the television news buzzing over the adjoining table.

"So what did you think of this morning?" Kathy Bode said. His chief associate in the negotiations, Kathy wore a grey suit and tie, and kept her hair short and straight, looking every inch the objective-minded professional.

That she managed to hide an ounce of human sympathy behind her tightly combed and clipped appearance, however, provided John with a saving ounce of comfort. He found himself looking forward to that ounce of comfort more in recent days.

"I have the feeling things aren't going exactly well," he said.

He took another bite of the bland sandwich. Kathy appeared to enjoy hers.

"Sato does seem to be hitting hard on the Moon base issue."

"We've told him enough times that

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NASA's abandoned those plans, haven't we?"

Kathy nodded. "He doesn't believe us."

"Why should he?"

"Why should we lie?"

"It's in the system," John said. "We can't help it."

"The president's even said in public that we aren't going for the Moon base."

"Yeah, but he won't go public to say he's going to insist on five billion a year for Mars. Not over the span of time it'll take. That's what we need to hear him say."

John thrummed his fingers on the table, then attempted another bite of the sandwich. It irked him he couldn't sit down with Sato and find out the real issue: how serious was Japan about Qatar?

He'd spent some time on the Internet trying to access information on Qatar. The small country, inconspicuous as it was, turned out to be less a red herring than it seemed on first glance. While most of the Qataris followed the Wahhabi interpretation of Sunni Islam, they tended to be less strict than their Saudi Arabian neighbors. The religious leaders had apparently fought against introducing televisions to Qatar—unsuccessfully—but hadn't found all areas of technological innovation anathema. In fact, the tiny country, amounting to only 10,000 square kilometers in area, had the highest rate of telephone ownership in the Arab world.

The State of Qatar, as it was formally known, put a tentative toe into space in 1976, when it launched its first communications satellite. Sometime during the next twenty years the government elite—a highly educated group of people, due to their privileged status as members of former royalty—became aware of the opportunities the major space-faring nations were bypassing.

Experts in technology, social change, and economic development world-wide had long been advocating a new push into space, preferably a large project on the scale of an expedition to Mars. Every previous step in the development of space travel had resulted in tangible economic gains on Earth; and while every nation benefited from scientific spin-offs of space technology, the nations that led each pulse of space development invariably benefited the most.

Nations both East and West dragged their feet when it came to the large commitment needed to tackle a Mars voyage, however. Europe was sinking resources into orbital stations, while China looked to the Moon. America had convinced itself it would build in orbit, build afterwards on the Moon, and *then* —probably fifty years or more down the pike—look to Mars.

Investors in Qatar looked at existing plans discarded by other countries for a Mars expedition that could be launched from Earth on relatively light craft, with support vehicles launched in a regular sequence, and realized they could make the plans real with relatively little support of their Arab neighbors and perhaps one major partner.

By the time America revised its

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plan and started thinking in terms of Mars *now,* Moon *later,* the Qataris were already deep in discussion with the Japanese.

Slow—the Qataris *did* have a reputation for being slow about things.

The Japanese, always quick to understand, realized that rather than being slow, the Qataris were better described as cautious and patient.

They could plan for the long-term: Qatar, a stable country with reserves of oil and natural gas to carry it far into the new century, and with a system of government that mixed democracy and the traditional sheikdom, could look beyond the two-year curtain that so often blinded the American Congress.

"Look," Kathy said, pointing up to the television over the next table. "It's *Carla Tuelbi.*"

John looked up just as the woman's face flicked off the screen. Enough discussion followed, however, that he caught the gist of the news story: Dr. Carla Tuelbi, head of the scientific advisory panel to the new governmental population task force, had become increasingly vocal about efforts within the government to undercut the task force's efficacy. All her efforts to establish population guidelines had been stymied.

Now, she'd been sent packing.

"This country's going to hell in a handbasket," John said, looking down again and grimacing at the tossed salad, pale and lifeless in its bowl.

He hesitated before answering the phone on his desk.

He lacked any real reason to hesitate. The feeling of impending failure he had—?

That might well have arisen from his interview with the vice-president, earlier in the afternoon. Scheduled to be a short session, Vice President Kelly had probably intended to exercise her position as head of the National Space Council by encouraging him in the ongoing negotiations. Monura had turned it into a gripe session, since it was as close as he'd probably get to the president's ear: *Why can't policy be rational around here?* he said to her. *What's the matter with being a little bold and taking this Mars Initiative by the throat and going for it whole hog? This is one of the most important opportunities this nation faces, and it's slipping through our hands! Someone else is going to gain a huge technological edge if we can't nail down this co-op package with Japan—and* then *where's our economic recovery going to come from? When's this country going to make a stand and stick to it? Is it so goddamned difficult to make a long-term commitment?*

Vice President Kelly had uttered a few palliative words and ushered him out.

The phone kept ringing. He picked up the receiver.

"John Monura here," he said.

"John? This is Roger Haldings. I've some pretty bad news."

I'm ready for it. "Go ahead. Shoot."

"I hate to be the one passing this along. But the word comes from up above that we need someone new in charge of negotiations. I'm sorry, John."

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"Was being replaced?" His voice [illegible] out too small. *This* caught him by surprise. And it hurt, much as he hated to acknowledge it. He'd expected news from Sato's team, positive or negative.

"[illegible]," the senator said. "I've tried to [illegible] to you. I told Kelly that Kathy Bode should be named. How do you feel about that, John?"

Great. Make me step down and then ask my advice. "I'm glad you made that choice. Roger Kathy knows exactly how the negotiations have gone so far and will do a good job bringing them to a conclusion in the days ahead." He felt like a machine speaking. *I've kept her fully informed of every stage of the negotiations.* "And we see eye to eye on our long-term chances of failure."

"Good," Hedgings said. "Once again, John, I'm sorry this had to happen. It's out of my hands. The least I could do was recommend Kathy."

"Thanks. I appreciate it."

After John put down the phone, the office expanded around him. He saw it in a new light. The fluorescent tubes buzzed. Air whispered from the vent. The corner of a picture tipped against the tan wallpaper in the faint air current. Strange—the room seemed strange.

He'd been here daily, for at least a few hours each afternoon, collecting [illegible] but he had ceased to see the space. He'd inhabited it over the previous years, rising through the diplomatic bureaucracy associated with the National Academy and NASA and the National Space Council, building a resume that pointed toward one effort. He wanted to help get humanity to Mars.

A few pictures on the wall showed the stark face of the Moon, lovely in its own way.

Most, however, showed images taken from Martian orbit by the U.S. Mariner spacecraft, computer-enhanced portraits of the immense length of Valles Marineris, and the ruddy, rock-strewn desert scene captured by the *Viking I* lander. He saw them again, staring at them. Familiarity had rendered them invisible; and yet they had been with him constantly, subconscious reminders of the enthusiasm that had made him chart his professional course in this direction in the first place.

John had grown up with Mars. As a kid he'd discovered the Mars of Edgar Rice Burroughs in flashy new paperbacks, and the Mars of H.G. Wells in a weathered, musty volume, and again in tapes of an old Orson Welles broadcast. In study texts he discovered the Mars of Schiaparelli and Lowell, and the anti-romantic portraits shot by *Viking*. Nothing dampened the romance, however: books by Heinlein, Asimov, Bradbury, and Clarke fueled it—even the Frank Herbert books with their Mars surrogate planet of Dune. Mars *lived* in a way even the third planet could not.

His imagination fired, John had become a NASA public affairs officer, a liaison officer, and finally a negotiator involved in international partnerships, working out of a Washington office.

Finally, when one of those deals be-

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ing negotiated revolved around a possible expedition to *Mars*—

It was just swept away.

By vice-presidential fiat.

John pulled out the bottom drawer of his desk. He hadn't poked through its contents in some time. Miscellaneous NASA photos mixed with prints by such aerospace artists as Di Fate and Bonestell. At the bottom lay a set of reproductions, held together by a rubber band.

John lifted them out, cleared a space on his desk, and spread the prints in a fan. Paintings and line drawings by Roy Krenkel, Gino d'Achille, and Frank Frazetta illustrated moments from the Burroughs Mars books.

Fantasy, pure fantasy. Multi-armed creatures, air boats, swords, banths, zitidars—was he remembering the names of the creatures correctly?

Did it matter? Maybe he'd been losing hold, and embracing fantasy more than the reality of his situation. He was a negotiator, dealing with nuts-and-bolts issues.

Correction: he *had* been a negotiator.

A sheet whispered out of his office fax. A few seconds later, a second sheet followed.

The first he had almost expected. A dinner invitation, from Kathy. Consolation time.

The second, however, came as a surprise. Again a dinner invitation, it mentioned a time, and a place—the Genji Garden. He recognized the neat handwriting of the signature before he read the name itself: Ryoichi Sato.

John scribbled a note over Kathy's invitation and sent it back: "Can't. Drinks later tonight?"

Then, slowly, he shuffled together the Krenkels and Frazettas, replaced the rubber band, and restored them to their place at the bottom of the lowest drawer.

Ryoichi Sato ate his sashimi with evident pleasure, and ample wasabi. A tall, thin Japanese man, in his fifties, he peered from behind wire-frame glasses at his selections of raw tuna, shrimp, and octopus with a look of almost filial affection, and drank from his Asahi with relish.

John Monura had taken Sato's suggestion of the unagi don, after turning down his first suggestion of sashimi. For all that it looked like strips of blackened leather on rice, the eel tasted excellent. The Asahi beer, new to him, also turned out to be a good choice. Despite his one-quarter Japanese blood—or perhaps because of it—he remained a stranger to Japanese cuisine, tending to true-blue "American" food, which usually meant a lot of Italian and Mexican dishes, with a few fish sandwiches and hamburgers thrown in.

After eating, they sat with more Asahi and regarded each other. Neither one had breathed a word about the negotiations or Monura's dismissal from his post as negotiator. John waited for Sato to break from the pleasantries.

"I'll tell you something, John," Sato said. "Unofficially. Since you're no longer with the negotiations—"

"I should stay mum? Until after you make it official?"

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Sato smiled and nodded, sipping his beer. "You've won my respect, John. Even if your own superiors have treated you badly—" He made a slight face at the mention of *superiors*. "—I can't treat you any differently than before."

"Thank you." The beer was doing its work. John felt more relaxed than he had in weeks. Maybe being relieved of the burden of the negotiations wasn't so bad a thing.

"So you'll be first to know," Sato said. "Japan is going to Mars. America may well go to Mars, too. But not with Japan. We're going into a partnership with someone else."

John felt his ease slip away. "With who? Not Qatar?"

Sato nodded, and sipped his beer.

John remembered Senator Haldings's words: the good *little* guy never wins against the good *big* guy.

But if the good *little* guy wins, then maybe the big guy. . . .

John had always thought he'd been working for the *good* big guy. The always-winner. According to the rules, the never-winner—

Well, never won.

Except this time.

He looked into his beer, and puzzled over his reaction. Why didn't the news bother him more? Sure, it disturbed him some. But at the same time he felt *glad*. One of the tensions of the negotiations, for him personally, had lain in the fact that he hadn't known if he could believe his own side. The United States actually going to Mars? It had abandoned its Moon initiative after a few landings, and had trimmed its orbital station to nearly nothing over a decade of shuffling its feet. Would it really go to Mars? He could hardly believe it.

But the Qataris—if they were joined by the Japanese—if *patience* were to be met with *means* and *momentum*—then reaching Mars suddenly looked to be a real possibility.

The old enthusiasm hadn't left him after all. He felt his blood beating more quickly.

"Why?" he said to Sato. "What made the difference?" He waved his hand as Sato opened his mouth to reply. "No, no, Ryoichi. Let me guess. It's because the Qatar enterprise is oriented 100 percent behind going to Mars. They have no other space projects except Mars. And it's because they've made a commitment of *twenty years*, which we can't match. And since English is the language of business, communication would be no more an obstacle than in America."

Sato shook his head. "Those are important, yes. Especially their commitment, which they've already demonstrated in developing the center at Musay'id. We've looked at it, and what they've done is amazing, given the fact they're new to the space effort." Sato looked fixedly at John, and then addressed himself to his Asahi again. "Choosing not to join the United States in this partnership is an extremely serious decision. Very difficult to make. But certain events have swayed us."

"Events?"

"You heard about Dr. Tuelbi?"

John sorted through his head, and remembered the news report: Dr.

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Tuelbi had been forced to step down from her position on the population control task force. He'd forgotten, having been preoccupied with his own troubles.

"America needs to come to grips with the population problem," Sato said. "Just as Japan has. Dr. Tuelbi offered this country a rational approach, and criticized the foot-dragging of the President and Congress. Do I describe the situation fairly?"

John nodded. *And then they fired Tuelbi. For the criticism.*

"So what are we to think, as outsiders?" said Sato. "Say you are captain of a ship, and your first mate comes to tell you about a hole in the ship, and that the ship is sinking. So then you demote the first mate? And choose another?"

John realized what Sato was saying. He wasn't talking about Tuelbi. He was taking about him, about John Monura: for he'd openly criticized the country's inability to think of the long-term, and he'd just been replaced.

"Maybe it isn't appropriate to say this," Sato said quietly. "But in Japan we remember how Emperor Hirohito acted toward the end of the war. When things were starting to go badly, and his messengers began to bring bad news, he sacked the messengers. So the messengers started lying, telling him that things were going well when actually things were getting worse and worse. You see? Hirohito punished the ones who told the truth, and as a consequence became blind to the real situation. How could he win the war, when he no longer saw how the war really looked?"

John saw the situation with perfect clarity. To the Japanese, the U.S. government was showing its true colors. The country had lost touch with reality.

"One other thing, John," Sato said. He waved to a waitress and indicated their empty beer bottles. "I hope we can work together again, in the future."

"That would be nice," John said, knowing such a thing would never now occur.

"I'm serious," Sato said. "Although we're working with Qatar, at some point in the development of the Mars project we'll need to work with private American industry. It's unavoidable. And for that, we'd like a good liaison person. Your name's been brought up several times."

John felt like a traitor to his own country. He immediately wanted to say, *Yes! Yes!* He might then still work toward that goal of his, of having some small part to play in getting humanity to Mars. "It would be impossible, Ryoichi," he said. "Even if I were to stop taking my government paycheck today, I couldn't legally take employment with a foreign government—or even accept employment in the aerospace industry—for five years."

Sato folded his hands, and nodded at the waitress as she brought the new beers.

"That would be fine," he said, as if John had accepted the position. "This is a twenty-year partnership we're entering with the Qataris, John. We'll be at a stage where we may be approaching some American aerospace

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companies in, say, five or six years."

Ryoichi's words stunned John. "You're offering a job—to start five years from now?"

Sato grinned. "If you're willing to make a commitment. That's something we know about you, John. You were like Dr. Tuelbi. You criticized your own government for dragging its feet, because it wouldn't make a long-term commitment like the Qataris were making. But what about you personally, John? Can you make that kind of commitment?"

John remembered his own tirade at the Vice President: *Is it so goddamned difficult to make a long-term commitment?*

He wondered how easy it would be to drop out of government. He could certainly find positions in the private sector that would suit him—even ones that might keep him abreast of matters that would help him, when he became professionally involved once more in moving humanity toward Mars.

Would he be a traitor? Certainly not to himself: all he wanted was to get humanity to Mars.

And wouldn't a petty display of loyalty to a government that didn't represent his interests be hypocrisy? Wouldn't he then be a traitor to himself?

And wouldn't he be a traitor to humanity if he turned down the opportunity to be *useful* in getting humanity to Mars? Was he a citizen of the United States first, or of the global village?

"Yes," he heard himself saying, with his Asahi raised in a toast. "Yes."

He was just a small player in the global space effort—

But if he had to be a little guy, he knew he damned well better be a *good* little guy.

Because sometimes those good little guys won. ■

There are many in this old world of ours who hold that things break about even for all of us. I have observed for example that we all get the same amount of ice. The rich get it in the summertime and the poor get it in the winter.

Bat Masterson

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Grey Rollins

SURVIVAL OF THE FITTEST

Principles that operate on organisms also operate in cultures—whether anybody likes them or not!

Illustration by Christopher Bing

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For a brief, tantalizing period the Holmes Door had connected the city of New York with Crisium, enabling instantaneous transit between Earth and Luna. The North American economy, borderline at best, had been given a badly needed boost by the insatiable Lunarian demand for durable goods. Whereas the economy had been on the verge of a recession, it grudgingly began to expand again.

Sentiment against the Lunar colonies crystallized when Emily Starnes, a homeless woman from Earth, starved to death in an unfinished tunnel deep in Crisium. The Lunar colonies enjoyed the highest standard of living in the human universe; that they had lived so well while Emily starved left many on Earth bitter.

Demonstrations were staged, blaming Lunarians in general and Alan Lister, the Commissioner of Crisium, in particular, for her death. One demonstration, held outside the New York terminus of the Holmes Door, grew violent. Police were forced to disperse the crowd with tear gas and capsaicin. Three men ran into the terminus to escape the gas and crossed through the Door into Crisium. Shortly afterwards an anonymous caller on Earth claimed that they were carrying a bomb. Curfews were imposed and Crisium was nearly paralyzed. In spite of the fact that the call was found to be a hoax, the incident made an indelible impression on the citizens of Crisium—they were vulnerable.

Weeks later another demonstration was held. When it threatened to turn into a full scale riot, the Holmes Door was closed, effectively cutting the only practical link between Earth and Luna.

The fragile North American economy collapsed like a house of cards. Within weeks, layoffs began. Out of work, and with the world seemingly crashing about their ears, they blamed the Lunarians. More demonstrations were held. Thousands showed up, chanting slogans and demanding that the Holmes Door be reopened and trade resumed.

But while the closed Door prohibited physical travel between Earth and Luna, news beamed freely. The angry, nearly hysterical tone of the demonstrations only served to convince the Lunarians not to reopen the Door.

The Lunar economy staggered, endured a short recession, and began to recover, even as the interlinked national economies of the world beneath plunged into a full-fledged depression. The obvious disparity in prosperity only served to further anger the people of Earth.

A quarter Earth hung in the sky like some impossible blue bauble. Even after the better part of a year, it still seemed strange to Mike Ordner. Like so many other things, the Lunar sky served only to emphasize the fact that he wasn't home. Unfortunately, he was trapped here on Luna, effectively a political exile.

He had no one to blame but himself, of course. After all, he had crossed through the Holmes Door of his own volition, the last living person to make the transit. Still, as much

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as he liked and admired the Lunarian culture, most of his friends and all of his family were still on Earth.

He had talked to his parents the day before—his birthday. His married older sister was pregnant. His mother had a cold. His father was on the verge of losing his job, destined to become another statistic as the North American economy worsened.

He shook his head. To think that he had played even a bit part in the drama that had led to the collapse of the economies of entire nations. It beggared the imagination to think that one man could make a decision that could influence events on such a vast scale.

And he had saved the life of that man....

Could he, himself, be responsible for the collapse? If he hadn't knocked Commissioner Alan Lister aside, Lister would have been shot, perhaps fatally. Then Lister wouldn't have made the decision to keep the Holmes Door closed. If the Door hadn't remained closed, then perhaps the politicians and economists on Earth might have come up with a way to save the faltering economy. Perhaps his father might still have a job.

And if pigs had wings, they might fly....

He shook his head again. If he kept up that train of thought, he would end up with an exaggerated view of his own importance. He had simply been in the right place at the right time—or the wrong place at the wrong time, depending on how you looked at it. All a matter of perspective.

Which was something he lacked. To him, it was all very personal, very real, and very lonely. He had come out on the surface to try to get away from the relentless bustle of the corridors of Crisium. He had wanted time to think. All he had accomplished was to turn confusion into depression. As much as he wanted to fit in, he still felt like an outsider. No matter how much they lionized him for saving Alan Lister's life—people he didn't even know still stopped him in the corridors just to shake his hand—he still felt as though he was not a part of the city.

The timer in his suit chimed softly, alerting him to the fact that he had been on the surface for an hour. There was no danger of running out of oxygen; the suit was fully charged and was good for hours more. It was just to keep him aware of the passage of time.

He had just wasted an hour on the surface feeling sorry for himself. He was honest enough to admit that much.

He stood, glanced once more at Earth, and started back towards the airlock. His father might be a quarter million miles away, but his advice rang clear. If you're depressed, get busy—nothing blows out the cobwebs like a sense of purpose.

Briefly he wondered if that's why the Lunarian culture was synonymous with hard work, much the way the Japanese had been in his grandfather's day, and the Australians in his father's. Could the Lunarians miss the green comforts of Earth as much as he did? Did they drive themselves so

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hard only to forget what they had left behind?

Terry Woods stopped by her supervisor's office on the way out. The man behind the desk had his chair rotated so that he could stare out the large plate windows. It was raining outside and quite cold. Cold enough that some of the rain was beginning to freeze to the ornamental shrubbery.

"Herb?" she called softly.

Herb Withers let his breath out noisily, then said without turning, "Yeah, Terry?"

"I . . . uh, just wanted to say goodbye. It's been nice working with you."

This brought a small grunt out of him. Slowly, he pivoted until he was facing her squarely. He nodded slightly. "Yeah, been nice knowing you."

"What are you going to do now?" she asked.

His mouth twisted. "I don't really know. I didn't have a backup plan." He gestured around the office. "I'll have to start from scratch. It took everything I had just to keep the doors open this long." He shook his head slowly. "I guess I'll be looking for a job, same as everybody else."

"You won't be alone."

He snorted. "What consolation is that? I owned my own business here. Out there, I'll be lucky to earn enough to buy a new pair of shoes, much less get ahead." He shook his head again, then smiled sadly to himself. After a moment, he said, "Hey, remember when we got that contract from Westinghouse a couple of years ago? Man, that was something."

"We didn't do so badly with Lunar Applied Sciences, either," she offered, then immediately bit her tongue, wishing she had brought up an Earth-based company instead.

He didn't take it badly. "Yeah. We made a lot of money out of those folks. Who'd have thought it would end this way? I never thought I'd be bankrupt, Terry, I can tell you that."

Faintly, she thought she smelled bourbon. That and the fact that his speech was slightly slurred led her to wonder. "Herb, are you going to be OK? I mean, have you got enough to live on for a while?"

He waved her off. "I'll be all right. Don't worry about me." Then, quietly, he muttered under his breath, "Machine tools. Who'd a thought everybody could get along without machine tools, for God's sake?"

She hazarded a reply. "They're doing without food in some cases, Herb. There was another food riot yesterday."

He looked up. "Where was this one?"

"Miami."

He nodded and lowered his head again. "Food riots. In the good old US of A. I'm glad my father didn't live to see this. It would have killed him."

"The President said she's going to set up a fund to help buy enough for people to eat," she supplied helpfully.

"The President's an ass. She spent us into this hole, anyway. We'd be better off if someone had assassinated that idiot the day she won the election. She doesn't know a deficit from a hole in the wall."

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Terry's face hardened. "We wouldn't *have* a deficit if we hadn't built the Lunar colony. All that money . . . wasted. Now they're off on their own up there, having the time of their lives while we pay the bill."

Withers raised his head. "Not so, my dear. Not so. A lot of money, to be sure, but only equal to about a fifth of the deficit, even if you had all the money in one place at one time."

"But—" she began.

He waggled his finger at her. "Don't forget who paid your paycheck these last two years. Lunar Applied Sciences, thas who. Don't forget it, child. A lot of that money came back. Yessir, a lot of it. Unfortunately, I spent it all, already."

No question about it. He was drunk. Or getting that way. She started to turn away in disgust, then remembered that it would probably be the last time she saw him. "Well, you take care of yourself, Herb, OK?"

He nodded to himself. "Yeah, I'll do that. I'll do ezzactly that." His head popped up suddenly. "Did you get your desk cleared out? As soon as I lock the door tonight, that's it. You won't be able to get back into the building to get a comb, if you left one behind."

She shook her head. "I've got everything."

"OK . . . well, OK." He blinked at her. "I know it's late to be saying this, but did you know I always thought you were a helluva good lookin' woman? Always liked lookin' at you." He laughed to himself. "Even when I got mad at you. Couldn't fire you. I'd miss ya too bad if I did that."

Clearly, he had taken a big belt just before she stopped by and the alcohol was seeping into his system as they talked. She wasn't sure she was prepared to handle the direction the conversation was taking. "Well, I've got to be going now, Herb. You take care."

He grimaced, as though reluctant to lose control of the conversational topic. "Yeah, yeah, yeah. See you. Take care of yourself, Terry."

"Bye, Herb," she said, not wanting to stay around him any longer than she could help.

"Hey," he called, just as she turned to leave, "let me know if you hear of anybody that's hiring, OK?"

But that wasn't necessary. Two days later she heard that he'd shot himself . . . still sitting in his office chair.

Commissioner Alan Lister snorted. "No matter how you try, you can't foresee everything."

The image of Anne, his wife and secretary, who worked from their home tunnel, raised an eyebrow. "What now?"

"We're running out of college grads, of all things. I knew there would be a shortage of certain raw materials after the Door was closed, and I did the best I could to prepare for it. Tools and things we can make for ourselves, if we have enough steel, but brains we cannot make—at least we can't properly educate them."

"So start a school. Surely we have people here who know the things we should be teaching."

He shook his head. "In the long run

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we're going to be doing that, obviously. But the problem is that we need trained minds *now*. Even if we opened a first-rate school today, it would be four years before we had a graduating class. Hell, we don't even have enough college-aged kids to fill the classes yet." He mugged a wry smile. "And I'll be damned if I'll give everybody the day off with instructions to go home and have some kids."

Anne grinned impudently. "At least we won't have to worry about going through accreditation procedures. We don't have to care diddly about what Earth thinks about our schools."

He grimaced. "Probably all for the better. Look at the people they're graduating down there . . . some of them are illiterate. What good is a diploma if you can't read it?"

"So what are you going to do?" she asked.

"Well, I've got an idea, but it's not what you would call practical."

"Try me."

"Steal 'em."

"Steal what?"

"People."

"Alan, I'm your wife. Part of being a wife is standing by your husband, even if he seems a bit daft. If I didn't know that you have the ability to pull an occasional rabbit out of the hat, I'd—oops, hang on a second. Let me see who's calling."

She was back in seconds. "It's Mike Ordner. Do you want to talk to him?"

He nodded. "Sure. The problem with Mike is not that he bothers me—it's that he doesn't bother me often enough."

"OK, I'll punch him through."

"Hi, Mike," Lister began, then belatedly noted the other's expression. "Is something wrong?"

"Well, yes and no. Got a moment to talk?"

Lister frowned and settled back in his seat. "For you, I always have. It's not every day I get to talk to the guy who saved my life."

Ordner looked embarrassed. "I was just there, OK? Just what you might call an interested bystander. I certainly didn't set out to be a hero."

"Mike, I'm not an expert on these things, but I daresay that those who set out to become heroes seldom achieve their goal, or if they do, they usually don't live long enough to enjoy the rewards. Real heroes just kind of fall into the role without premeditation. It's in the job description, I think."

A strange expression passed over Ordner's face. "You're a hero, at least to the people of Crisium. How do you deal with it?"

"Let's get one thing straight, Mike. I don't think I'm a hero. I'm not even so sure that the people of Crisium think I'm a hero. And even if they did, I'd do everything in my power to dissuade them. I'm just the guy they elected commissioner. The title of Commissioner doesn't translate as a license to go around heroing."

"But you did. You were in a tight spot, you made a tough decision, and now everybody thinks you can walk on water."

Lister laughed freely. "I don't really. It's just a rumor I started to enhance my reputation. Want me to spread a

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few good stories about you? What'll it be? Raise the dead? Change water to wine?"

Ordner blushed and shook his head. "Just the opposite. I don't want to be a hero. I'm having enough trouble fitting in as it is."

"What's wrong? Air up here in the hero's club a trifle thin for you?"

"I talked to my folks yesterday, Alan. My father's going to lose his job. The reason I called . . . what I really wanted to know was if there was any way I could go home. Possibly a shuttle, or something."

Nodding slowly, Lister said, "The fog begins to thin."

"They don't have any savings to speak of. They'll be broke within a month."

Lister thought this over carefully before speaking. "Other than lend a sympathetic ear, is there anything you could do if you were there?"

"I might be able to help out somehow."

"Mike, 'somehow' is a marvelously vague word. You're brimming with good intentions, but I fail to see how your physical presence will help your father keep his present job or get a new one."

After a moment, Ordner reluctantly admitted, "It wouldn't. Worse yet, I'd have to give up my job here. Still, I feel so helpless—so *guilty* just standing by."

Lister sighed. "I seem to have achieved a certain notoriety by pointing out the obvious, but the folks on Earth dug this hole and jumped in it all by themselves. There'll be hell to pay before they get back out. Anybody with an ounce of sense could see that things weren't going well, but few seem to have had the foresight to lay aside resources for the hard times ahead."

"And that includes my family," Ordner said bitterly. "My brain says that you're right, but my heart wants to call you a callous bastard."

"If it'll make you feel any better, go right ahead. Enough other people have."

Ordner shook his head. "It's one thing to watch it happen to another family. When it happens to your own, it's difficult to remain objective."

"Mike, the only consolation I can offer is that these things always pass. Times are hard for a few years, then they slowly get better. At first, people refuse to believe that conditions really are improving, so the hard times seem longer than they actually are."

"But they're just beginning," Ordner said.

"It's been going on for over a year—the end was in sight even before the Door closed. Anne says that they've still got at least two years ahead of them."

"Two more years! If the depression down there lasts that much longer, there won't be anything left."

"Then you probably don't want to hear what comes next."

Ordner stared. "What?"

"War. Every time the economic cycle craps out like that, there's a war. Often it's a big one. The 1930s cycle led to World War Two. The one at the turn of the century laid waste to the Middle East, parts of southern Europe, and half of northern Africa, even

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though it started in Korea. My guess is that this problem between Brazil and Argentina will be the center of the next one."

"Man, you sure know how to cheer a guy up."

"Ah, but it's like the Phoenix, you see. Whatever else you can say about war, it stimulates the hell out of the economy. That, in turn, leads to an economic recovery."

"The cure's worse than the disease."

Lister shrugged. "Economic woes lead to wars as blood attracts sharks. The fact that people are out of work and that their standard of living is falling leaves them open to the idea that it's somebody's fault. People who are hurting financially are frightened and angry. They're only too willing to strike out. Hitler would never have gained a foothold if the German people had not endured gross mismanagement of their economy. Damned if they didn't do the same thing over again when they reunified Germany. They merged a weak East German economy with the strong West German one, dragging it down. Presto! High inflation, the economy faltered, and suddenly there were neo-Nazis in the streets. Almost as if they were working from a script. In the end, Germany got off light compared to Israel and Iraq."

Ordner looked worried. "What you just said about people wanting to strike out struck home. My father was wishing he could get his hands on someone . . . anyone. Whoever it was that caused this whole mess."

Lister nodded. "Now imagine an entire country full of people who feel that way. Since they're out of work, they have plenty of time to sit around and brood. If anyone so much as looks at them cross-eyed, it's enough to set off an incident far out of proportion with the provocation."

Ordner laughed bitterly. "It's ironic. One of my father's favorite pieces of advice is that if you're depressed, get busy. My grandfather put it differently—he used to say that an idle mind is the Devil's workshop. I'd never realized that it could apply to an entire country."

"Mike, it works all the way up and down the line, from the farmer in the field all the way up to the federal government. If governments abided by the same rules that work for individuals, we'd have far fewer problems."

One business that had survived was Connor's Corner, a small bar in Detroit nestled between a laundromat and a defunct furniture store. Loyal, long-time customers could be counted on to show up at least two or three nights a week to nurse a beer and engage in good-natured arguments about everything from baseball scores to which brand of pretzels tasted best.

Sheila Haskel walked in, paused to shake off the cold rain from her coat, then sat at the far end of the bar, the one nearest the booths, and said, "Miserable weather we're having. Do ya reckon the weather runs in the same cycles as the economy?"

Carol Willis, seated in the end booth with her husband Hank, replied, "Don't see how. I mean, how

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are the clouds supposed to know?"

Reg Arnold, another reliable customer, said, "That's backwards. It's the weather that runs in cycles and causes the economy to poop out."

"If that's true, then it's no wonder that those folks on Luna are doing so well. There's no weather to mess 'em up. They'll just keep right on ticking while us poor suckers slog through the rain and the cold and the fog," Hank said.

"I'll bet they're laughing their asses off up there. I mean, they know we're having it rough, right? They still get our news, same as we get theirs, right? They sit there snug and warm while we freeze half to death just to see a few friends," Carol put in.

"Is it true they never have to go outside?" Sheila asked.

Reg nodded wisely. "Not unless they want to. Everything is all connected together, and it's underground and everything, so all they do is walk around. They don't even own *cars*."

Sheila shook her head in wonder. "Imagine that. I can't get anywhere without mine."

"It's about the only thing they don't have. They're doing pretty good up there."

"My brother went up there for his vacation a year ago, a couple of months before they closed the Door. He said it looks like a big mall, but you can jump a country mile if you want. He went out on the surface and walked around for an hour, too. He couldn't wait to tell me all about that part," Hank said.

"It'd be fun to live up there," Sheila said.

Hank snorted. "At least you could find a job. They had a little blivet on the news about how they couldn't find *enough* people to work up there. Now *that's* a corker, if you ask me."

Carol said, "I mean, it's not like people aren't going begging down here for jobs. And they're *wanting* people to work?"

Reg shook his head. "Well, then why don't they open that precious Door of theirs back up. Hell, I'd go to work for 'em. Right on the spot."

Sheila grimaced. "I must be stupid or something. They need workers, we need jobs. There ought to be some way or another that we could get everybody together on this."

"Wait a minute, now," Hank said. "It's not like they could hire enough people to make a difference. Even if they doubled the size of their work force, it would only be a drop in the bucket as far as we're concerned."

"Still, it would help," Carol observed.

Sheila said, "I don't see why we can't go back to using shuttles, like we used to."

"Most of the shuttle lines went out of business. As long as the Door was open, nobody wanted to spend thousands of dollars and spend a week being cramped into a seat the size of a matchbook when they could pay, what, thirty or forty and be there instantly," Reg pointed out.

"So?" Sheila persisted. "They didn't *all* go out of business. We still have runs up to the Circumterra stations and stuff."

Reg shook his head. "Not so many

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as you might think. Most of the traffic to the stations was through traffic on the way to Luna. When the Door opened, that stopped." He stopped and sipped at his beer. "You know, it's enough to make you wonder if they did it on purpose . . . killing off the shuttle lines like that, then closing the Door—one big plan from the very beginning."

Hank asked Sheila, "Supposing there *was* a flight going up there. What would you do? Go in and demand a job at gunpoint?"

"At the very least, we could bring our people home," Carol said. "I mean, they've got about twenty or thirty tourists who were caught when the Door closed."

"And that guy . . . what's-his-face, Order, or something," Sheila added.

"Ordner. I'm not sure whether I'd want him to come back. He took their side when the going got tough," Reg said.

"He was trying to save that guy Lister's life, for Chrissake. That ought to count for something," Hank put in. "Everybody knows I'm all for law and Ordner." He looked around expectantly, but the others ignored him.

"And he does have a job, from what I hear," Sheila admitted. "Maybe he did the right thing."

"Good riddance, I say. Let him stay up there," Reg groused.

"You're just jealous because he's got a job," Sheila teased.

"I am *not*," he declared, a bit too quickly. "I just happen to think he changed sides when it was convenient, that's all."

"I don't see anything wrong with it. I mean, we were just saying how nice it would be if people from down here could fill those jobs up there," Carol said.

"Yeah," Reg said, "but if he lived here, then the money he earned would be spent here. It would spread around and help more than just him. Nobody here gets a dime from Ordner. When he buys his groceries, the money stays in Crisium, and the people up there just keep getting richer."

Ron Abner lived with his wife in a tunnel on the eighth level of Crisium. It was a small tunnel, even by Lunar standards, about the size of an efficiency room at a cheap motel on Earth. The dining table was cramped between the foot of the bed and the miniature kitchen.

Ron was Mike Ordner's only close friend. They worked together at the Crisium-Besselton Door, doing the same work they had been doing while the Crisium-New York Door was open. Then, Ordner had been employed on the New York side of the Door.

"You're in a funk again, Mike," Abner's wife, Ellen, observed.

"It shows?" He sounded apologetic.

She nodded. "Afraid so. You look depressed."

He toyed with his spaghetti a moment before answering. "A little bit, I guess. I'll be all right."

"Thinking about your father again?"

"Some."

She nodded slowly to herself, eyes narrowed. "Susan," she stated flatly.

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Ordner didn't flinch, but his eyes lowered a bit. "Yeah, her too."

"Give up on her, Mike. She's gone."

"She's going to marry him."

Ellen didn't even blink. "Who? The guy she's been seeing down there?"

He nodded, but said no more, and made a great show of winding his spaghetti on his fork with elaborate precision.

"Listen, I won't say she's a stupid Earthling because I know that you still think of yourself as one, but I will go so far as to say that she's a stupid woman for not hanging on till this is over. She could have waited until they open the Door again, then, married a famous man . . . namely you. I think she's an idiot, myself."

His mouth twisted. "I'm not sure I'd want her to marry me just because I was famous, Ellen."

"Dammit, you know what I mean. Supposedly, she was already in love with you. You two had been seeing each other for over two years, right? Then the famous part should have just been icing on the cake, the way I see it."

"Apparently, she ran out of patience."

Ron spoke for the first time. He had already heard the basics from Ordner earlier. "Granted, it's been a while, and maybe she *did* get lonely, but I think she could have handled it a bit more gracefully. If she didn't have any more class than that, you didn't need her anyway. Find somebody better."

"A nice Lunarian girl," Ellen added, with just enough of a smile to let Mike know that she was aware of the irony.

"You won't rest until you've converted me into a blue-blooded citizen of Crisium."

"You already *are* one, you idiot!" she blurted. "Your feet are smarter than your head, Mike. *They* voted for Crisium when you came over. The rest of you just hasn't caught up yet."

"Hard to do when I left large parts of me behind on Earth," he pointed out.

"Her? *Huh!* Forget her. Get on with your life. Leave that baggage behind."

Ron raised an eyebrow. "Don't be too abrupt with him, babe."

She turned to face him. "Abrupt? I'm just sticking to the facts. She's dumped him for some Earth guy, which just goes to show you what a fool she is. I've never even met her, and I can tell you that much."

"Excuse me," Ordner mumbled as he pushed back his chair and headed for the portal.

Ron turned from watching his friend stumble out into the corridor. "Honey, let me teach you a new word, since it's obviously not in your vocabulary. It's called tact. It means not rubbing Mike's nose in the fact that he's just lost the love of his life, OK?" He got up and went after Ordner.

"Needs a nice Crisium girl, is what I say," Ellen muttered under her breath, then she looked over at Ordner's plate. "*Tsk!* And he didn't even finish his meal. . . ."

Roberta Lith had had the bad fortune to graduate with a degree in electrical engineering just in time to face a depression. Now, after over ten months of dreary job hunting, she had

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managed to land a position—working as a waitress.

"Talk about overqualified," she complained to her mother as they sat at the kitchen table. "I didn't go to school to become a waitress. I want to be an engineer, for God's sake!" She pushed a napkin in circles. "Maybe they'll need the toaster rewired," she muttered.

"Darling, be glad you've got a job at all. There are plenty of people who would be glad of what you've got."

"But I wanted to go to Luna and—"

Her mother's face took on a stern set. "Don't let your father hear you talk that way. We didn't pay all that money to put you through school just so you could go up *there*." The last word was delivered in a scornful tone that spoke volumes.

But Roberta did not heed the warning signs. "And why not? They've got guts, which is a great deal more than most people down here on Earth have."

Her mother's eyes flashed. "It's a little easier to have 'guts,' as you call it, when you've got plenty of money."

"Maybe everybody'd have more money if they'd show the guts first. This place has turned into quicksand, Mom, can't you see that? Anyone who wants to do anything, to accomplish anything, to *be* anything gets sucked down into the muck."

"Don't you talk to me like that, young lady! This," she gestured to include the house, "is not muck. It is your home. It has kept the rain off of your head since you were a baby. It has kept you warm in the winter. It is not *muck*. Your father and I worked hard to—"

Joseph Lith appeared in the door to the kitchen, eyes narrowed. "Is there some kind of problem?"

His wife pushed back from the table angrily. "Our daughter seems to have brought a few foolish notions back from school." She left quickly.

He stood there quite some time, staring at Roberta. She returned the gaze levelly, then said, "There's nothing wrong with the Lunar colonies, Dad. They need people like me."

"So do we," he snapped, then stalked off.

"I hate to admit it, Alan, but you beat me *and* my computer on this one," Anne Lister told her husband. She was calling him from her office at home.

He blinked at the non sequitur. "On which one?"

"Engineers and technicians. There was a slight dip in our growth curve, but I was ignoring it, thinking it would turn back up shortly. It hasn't. I started probing deeper and came up with the same answer that you did. I've rejiggered the basic assumptions in the computer model I'm using and it doesn't look good. Within a year our growth curve will stall unless we can get new talent."

It was near the end of the day and he was tired. He leaned back in his chair and placed his feet on his desk. He rubbed his jowls for a minute, then said, "Can't have that, can we? I was hoping that you were going to tell me that I was wrong."

"Not this time, dear. You were wrong last Thursday, remember?

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You've already used up your quota of wrongs. From here through the end of the month, you have to be right whether you want to or not."

He grinned tiredly. "And there are *how* many days left in the month? I'll never make it. I'll just have to be over quota."

"You were saying something the other day to the effect that you had an idea, but that you weren't sure it would work," she prompted.

"I was hoping that you had forgotten about that. It's such an iffy scheme that I'm hesitant to go forward with it."

Anne waited for the inevitable capitulation. It did not take long.

He rocked forward and placed his feet on the floor once more. "All right. See if you can roust up Jennifer Holmes for me."

Her eyebrow raised, but she did as he asked. After a moment, she said, "There's no answer at her office. She may have already left for the day. Do you want me to try her at home?"

He glanced at the time. "I guess so. She's probably just gotten in, but all I want to do is ask her a question or two."

Seconds later, Anne said, "Got her. I'm punching her through."

Jennifer Holmes looked frankly wary. "You want something."

His carefully rehearsed intro blown, Lister simply nodded and said, "Afraid so, Jenny. I've got a couple of questions I'd like to ask you."

"The last time you wanted something from me, it ended up costing a man his life . . . and I was the one who killed him. Care to give me a reason why I should listen to you this time?"

"Jenny, that was an accident. Nobody blames you for it."

She stared at him as though he had lost his mind. "Nobody? *Nobody?* Only half of the population of Earth! Is that not enough?"

There was nothing he could say to that. While it was true that most Lunarians accepted the fact that it had been an accident, many people on Earth did not. Briefly, he reflected that conversations never went the way that he hoped they would, then tried another tack. "OK, you're right, a man died. He was killed when you closed the Door, so from one perspective I guess that makes you guilty of murder, or manslaughter, or something. But from another perspective, he had a gun and was threatening people with it—specifically me. He had already fired once, and had it not been for Mike Ordner knocking me out of the way, we might not be having this conversation. However, he still had the gun and probably wouldn't have missed again, as I was an easy target there on the floor. Leaving open the question of whether my life is worth saving, he could easily have shot any number of other people, including you. If possible, it would have been nice if his life had been spared, but he happened to be straddling the threshold when you closed the Door, and it constricted on him. I'm very, very sorry that it happened, but he had also proved himself to be a threat, and perhaps it was justice that he was killed."

"That's justice?" she asked softly. "To kill a man by cutting him in half?"

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She sighed. "It's easy to see why you're so successful as a politician. You have a way of twisting things to make them seem reasonable."

His eyes widened. "I still have enough self-respect left to feel insulted. In all the time I've been in office, I think that's the first time anyone has called me a politician to my face. I must be doing something wrong if I'm falling into that rut."

She tried gamely to smile. "Then maybe there's still hope for you, Alan Lister. Just don't lose your perspective, OK?"

"I'll try not to."

"What is it that you want from me?"

"Answers. First off, I want to know if it's possible to have a single-ended Holmes Door."

She closed her eyes briefly. "I've sworn off of the Door, Mr. Lister. It's turned into a nightmare for me. I still hear that man's screams in my dreams."

"Please?"

She took a deep breath. "Yes, it's theoretically possible. The problem is with control. The singularity tends to drift, with results not unlike those you saw when I closed the Door and killed that man."

"Oh," he said simply. "Is there anything that can be done?"

"Take a laser. Shine it at a particular rock on the far side of a large crater. If your hands are steady, you might be able to make the beam hit the rock, but your aim would tend to wander. Add to that the fact that it's difficult to tell if you're actually hitting the right rock. Face it, from a distance, one rock looks pretty much like another rock, right?"

He nodded.

"Well, the solution, other than holding the beam very steady indeed, is to put a mirror on the rock you want to hit. That way, when you hit the right one it flashes back at you quite strongly, and you know for certain that you're hitting the target accurately. That's what the equipment at the New York terminus did—it served as part of a feedback loop that kept the singularity locked tightly to one precise location."

"It sounds like you're saying no, but in a roundabout way."

She grimaced. "There is another way. And may God have mercy on my hypothetical soul for telling you so, because I'm sure you're going to want to do it. . . ."

Prices are dictated by supply and demand. Nowhere was that more clearly demonstrated than in the tiny warehouse tunnel on the fringe of the sixth level of Crisium.

To someone from Earth, the scene would have been ludicrous. The contents of the tunnel were predominantly ordinary wooden shipping pallets. There were also wooden crates and odd-length boards. In fact, nearly everything in the room was made of wood. Cheap, low-quality wood, at that.

And it was worth a preposterous sum of money.

On Earth, packing crates were carted off to dumps, burned, broken into splinters, or left in the rain to rot. No one cared. Wood was taken for granted because it was everywhere

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and easily available.

On Luna, however, there were precisely ninety-seven trees, the majority of which were to be found in Aldrin Park, in Crisium, although New London had a fair selection in the Atrium. The idea of cutting any one of those trees simply for the wood was guaranteed to send shivers of horror down the spine of any Lunarian. And in any event, even the largest was too small to yield any usable amount of wood. The trees, like the people, tended to grow taller and thinner than on Earth, and the diameter of the trunks was not sufficient to justify cutting them, no matter how desperately someone wanted wood.

So Marsha Seideman had seized an opportunity. When it became apparent that the Holmes Door was going to be closed more than just temporarily, she had gone around to every business in town and offered to take away all those bulky pieces of wood that were taking up valuable space. In most cases, they were only too glad to give her what she wanted.

Now she was making a killing renting the pallets to local businesses, in many cases the same ones that had given the pallets away just a few months ago. In the event that they came back broken, she added a surcharge, and used the sound boards to repair other broken pallets. The broken boards were trimmed down to five centimeter squares, sanded smooth, and sold as curiosities. Those who had been born on Earth had suddenly found themselves unaccountably homesick after the Door was closed, and a piece of wood was the ideal symbol of all that they had left behind.

Business was so good that she was beginning to eye the unbroken crates and pallets, calculating how much they would be worth as squares, versus their worth rented out for shipping purposes.

So far, rental seemed to be the better option, but the longer isolation went on, the more she was able to raise the price of the little squares.

Pretty soon, she was going to have to do some serious thinking about the rental end of her business. Of course, she could always raise the rental rates, too.

Decisions, decisions. . . .

The fastest growing business in Crisium, oddly enough, was a utility. In industrialized nations on Earth, utilities are generally considered one of the most moribund sectors of the market. They plod along, adding new capacity only when absolutely necessary. The utility business is regarded as a mature market.

On Luna, however, they were growing at an astounding rate. The leader was the air recycler for Crisium, the Lunar Air Commission.

Having endured a painful downsizing after the opening of the Holmes Door, they were once again in an expansion phase. In the beginning, Crisium had been entirely self-sufficient. The LAC had enjoyed a near monopoly, providing freshly oxygenated air to the citizens of Crisium. Other than a minor erosion of their customer base due to small-scale algae recyclers in individual tunnels,

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they had seen little in the way of competition; in spite of a slightly stale smell to the air, most people preferred the convenience of having their air delivered.

With the opening of the Holmes Door, that changed rapidly. Air circulated easily through the Door and people began to question why they should pay so much for a basic commodity when it could be obtained free through the Door.

Grudgingly, the LAC had installed an air intake at the Door. Revenues plummeted. Essentially, they were reduced to the role of a distributor.

With the closing of the Holmes Door, however, Crisium was again faced with the necessity of being self-sufficient. Water, electricity, and, of course, air became growth industries once more. The one exception was food. Food producers had enjoyed a thriving export market, both in staples and in luxury comestibles. Although they were hardly in danger of going out of business, they were now limited to a much smaller market.

While the Door was open, the population of Crisium had swelled dramatically and two new levels had been opened to accommodate the newcomers. Another level was half completed. Originally only minimal emergency recycling systems had been installed in the new levels.

After the closing of the Holmes Door, the need to install sufficient recycling capability to support day-to-day usage in the new levels had been urgent, to say the least. Indeed, the sudden lack of recycling capability had led to a rationing plan whereby businesses which needed air for non-breathing purposes had been forced to run only at night, when the demand for air was somewhat reduced.

As in any circumstance where supply and demand are out of balance, the LAC began to charge more for air. Profits increased.

In short, business was good.

Clifford Weber sat comfortably behind his priceless real wood desk, a relic of the good old days when the only way to get something made of wood was to have it imported on the shuttles. It had been unremarkable for the time period during which the Door was open. Now, due to the lack even of shuttle flights, it was worth more than ever.

"To every thing there is a season. We were beaten down nearly to nothing. Now we're back with a vengeance," he said comfortably.

"Yessir," his pet vice president said promptly. She nodded brightly.

He nodded to himself. "Things looked pretty dark there for a while. I don't mind admitting that. But this makes it all worthwhile. Victory is sweeter when you come from behind."

"Yessir."

He waved a hand negligently. "Keep reading, please. I'm sorry I interrupted you."

"Well, as I was saying, the third quarter profits were up nearly forty percent. Thirty-nine point four, to be precise." She raised an eyebrow in a deprecating manner. "Nice enough, I suppose. However, the fourth quarter results—the ones we will release to the shareholders next week—show

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an increase of sixty-three percent over the same period last year."

He nodded wisely. "Good, good . . . I'm pleased. The installation in the new level is on schedule?"

"Not quite, but near enough. Someone misread the blueprints and some of the ductwork was laid wrong. It will have to be taken back out and redone. Other than that, everything looks good."

"I suppose it would be too much to expect that everything would go our way," he said philosophically. After a few moments, he said, "You know, I've been thinking about changing our name."

His vice president frowned. "Our name?"

"The name of our company. Lunar Air Commission. This is no longer a branch of the local government, you know. The service was privatized years ago, but retained the original name for some reason. I've been thinking that we should consider changing the name to something more appropriate."

"Like what, sir?"

"LAC has a nice ring to it. I'd like to stay with something that had the same letters. Lunar Air Company would work, but I've always thought that the word company had a quaint flavor to it."

"Corporation?" she suggested.

He narrowed his eyes as though thinking, then nodded. "I like that."

"Better yet, why not just change it to LAC? Lots of companies have done that. And initials always sound so impressive."

A slow smile spread over his face. "Excellent. Superior. Splendid." He frowned. "Wait a minute . . . what is it that the kids say? Means splendid, or so I'm told."

"Splendo," she offered.

He nodded as though he had known it all along. "Splendo. Exactly. A new name and a new beginning."

"There's still time to release it to the shareholders," she pointed out.

"That's what I had in mind."

"There's just one thing, sir."

"And what's that?"

"What shall we say about our future prospects?"

He frowned delicately, reaching up to smooth the hair at his distinguished looking graying temples. "Why, we have every confidence that the prospects for the future will be even brighter. There's certainly no reason to believe otherwise."

"But what if they reopen the Door? We'll be right back where we were a year ago, only worse. We'll be carrying the debt we've taken on to finance the work on the new levels, but with reduced revenues."

He shook his head. "It'll never happen. I guarantee it. Look what happened the first time. All kinds of riffraff came through. They won't risk that again. Eventually, they'll restart shuttle service, but the Holmes Door won't reopen between here and Earth."

The tunnel was as small as they come. A steel box barely big enough to breathe in, or so it felt. Mike Ordner had come to Luna literally with only the clothes on his back and had bought not much more than the essen-

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tials since. He spent his time visiting with Ron Abner and his wife, or reading books displayed on the terminal; the tiny desk it was mounted on doubled as his dinner table.

He was reading when the computer announced an incoming call. He sighed and told the computer to mark his spot, then pointed at the icon to enlarge the caller. An involuntary smile spread across his face.

"Hi! Did I catch you at a bad time?" Alan Lister asked.

Ordner shook his head. "No, it's OK, I was reading a book, but the plot unraveled about two or three chapters ago."

"You sounded down when you called the other day, so I thought I'd check back with you—see if things had gotten any better."

"I hate to admit it, but you were right. I'd be more burden than help if I were down there. Unless I was phenomenally lucky and got a job the first day I was down there, I'd end up eating my parents out of house and home. That's the exact opposite effect of what I intended."

Lister nodded. "I wish there really was some way that you could do some good."

"My grandfather used to say that the road to hell was paved with good intentions. I think I'm finally realizing what he meant by that." He snorted and shook his head. "For what it's worth, I think I've figured out why I miss Earth so badly."

Lister cocked his head. "Why's that?"

"I never got to say good-bye. It's one thing to make a conscious decision to change jobs, to uproot your entire life, and move on. It's another thing entirely to have it come upon you suddenly, without time to prepare. I think when I jumped across the threshold of the Door, I was *jumping to conclusions*. Now I've had time to reflect on my hasty deed."

"I don't recall that you jumped across the threshold, Mike. You had more time than that implies."

Ordner looked pained. "OK, OK. In retrospect it *feels* as though I jumped. Mind you, I'm not saying that I made the wrong decision. In fact, I think that it was probably the right one. It's just that when you do something like that, it's better to take your time about it."

Lister nodded, was silent for a moment, then said, "I take it that by saying good-bye, you meant more than just being able to call your parents and explain that you had had a rather sudden change of address."

"I'm afraid so. If nothing else, I would have liked a chance to talk my girlfriend into coming up here. Possibly get married and raise a bunch of moon-brats. As things stand now, she's getting ready to marry somebody else."

"I'm sorry, Mike, I hadn't heard about that."

Ordner waved him off. "A friend of mine pointed out that I was probably better off without her. It stung at the time, but once I thought about it, it made sense. It's just not the way I would have chosen to end the relationship, if you know what I mean."

"Is there anything I can do to help you settle in, now that you're here?"

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"Not unless there's a shuttle headed towards Earth. I just feel that if I could see everything one last time, that I'd be able to let go. I don't suppose you've changed your mind about that, have you?"

"Not exactly, no."

Ordner's eyes bored in on Lister's. "Not exactly? What have you got up your sleeve?"

Lister's eyes dropped. "Nothing."

"Nothing, hell! Tell me, Alan."

He shook his head. "I can't."

"Alan, I've got a trump card I can play—you owe me."

Lister took a slow, deep breath, then let it out and took another before answering. "It may be possible."

"*What* may be possible, dammit?"

"You might be able to go to Earth, but it wouldn't be for long and there would be conditions."

"What conditions?"

"You couldn't contact your parents, or your girlfriend, or anyone else you know. It would raise too many questions."

"I've said everything I can think of to say to my parents, and my girlfriend is the *last* person I want to see at this point. I had a few other friends, but I've already begun to drift apart from them." He gave Lister a tight smile. "When do I leave?"

Lister's head snapped back. "Whoa! This may not even work. There are some technical questions to be resolved first."

"When do I leave?" Ordner repeated.

Lister sighed. "Mike, you wouldn't be able to stay more than a few days. A week at the outside."

"I just want a chance to stand on terra firma one last time, Alan. To say good-bye, not necessarily to the people I knew, but to Earth as a planet."

"You'll come back?"

Ordner nodded. "You can count on it."

"All right. You can go . . . *if* it works."

"That's all I ask."

With the inevitability of the tide, forces were building, both economic and social, on Luna as well as on Earth. Lunar immigrants who had left Earth without a backwards glance found themselves longing to walk barefoot on the beach, to smell the flowers in the park, to play in summer streams. With the characteristic perverseness of human nature, the mere possibility that they could *have gone back to Earth was sufficient to ensure that they would not want to. Having lost entirely the ability to go back, they found themselves yearning for a glimpse of the green hills of Earth. Their dreams were filled with skies that were blue instead of black.*

The Crisium Business Group had more pragmatic reasons for wanting the Door reopened. The tourist trade that had come through the Door had been extremely lucrative. The retail sector had suffered badly from the loss of the Earth-based tourist trade. The fact that they were able to tap the other two major Lunar colonies, New London and Besselton, now linked to Crisium by Holmes Doors, was small consolation.

The Crisium Business Group was not alone in wanting the Door re-

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opened, but they were opposed by others, like Clifford Weber of the LAC, who were equally determined that the Door to New York should remain closed. Many Lunarians, homesick or not, remembered all too clearly the trash and filth left behind by the visitors.

Every person born on Luna had a deeply inbred horror of contagious disease. They regarded a healthy environment as one of the fundamental ingredients of life on Luna. As long as the shuttles had been the only means of transportation, the time required to travel from Earth to Luna had served as a quarantine that trapped most of the germs coming up from Earth. While the Door was open, people from Earth had been able to pass through to Crisium instantaneously, sneezing all the way.

New London and Besselton, which had not had a chance to participate directly in the economic boom fed by the Earth-based tourist traffic, did not miss the money as much, and they certainly did not want the problems that they had seen arise in Crisium. Now that there were Doors open between all three cities, were the Door to be opened, they would be exposed to the same ills.

Earth, for its part, had feelings every bit as mixed. Some, such as the members of the environmental group Our Earth, saw Luna as a net source of carbon dioxide, something they felt that Earth's beleaguered forests could do without.

The United States Internal Revenue Service saw the citizens of Crisium as tax evaders, as they were all still legally citizens of the United States. Electronic transfer of funds was easy enough, but Alan Lister had had the foresight to place a hold on all economic transactions with Earth in order to keep the depression from dragging Luna down as well. So far it had worked, and he had no intention of allowing money to flow to Earth unless there were tangible results. The IRS gnashed its teeth and threatened, but it was unable to force compliance on people a quarter of a million miles away who had decided not to finance a bankrupt government. Legal battles were under way to freeze any lunar assets remaining on Earth.

The case of the tourists who had been trapped on Luna was a particularly sticky point. Most had elected to become part of the Crisium community. One couple had gone to Besselton after receiving word that their jobs on Earth had evaporated in the depression. New London had claimed a few others. By and large, they were facing their unintentional exile fairly well, but, like Mike Ordner, they missed families and friends and wanted to go home. The longer they remained on Luna, however, the harder that would be to do. After the better part of a year, their bodies were acclimated to the lower lunar gravity. Going home would not be easy at this late date.

To many on Earth, the fact that no Lunarians had been caught on Earth when the Door closed was evidence that the closing had been planned in advance. That Lunarians had rarely visited Earth was seen only as confirmation of the perceived conceit of

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the colonists. No matter how many times explanations were offered that Lunarians simply couldn't stand the gravity, they persisted in seeing it more as the result of an elitist attitude.

Everyone on Earth and on Luna had opinions as to whether the Door should be reopened. The opinions were often strong. Many were torn between conflicting feelings.

One way or another, something had to give. The love/hate relationship was too unstable to last.

The snow was heavy and tended to clump as it fell. Already there was an accumulation on the sidewalk outside Conner's Corner, and a wet area inside the door where it had been tracked in on customers' feet. Not many people seemed disposed to brave the weather and the small group in the booth at the back had the bar to themselves.

Carol Willis sat staring moodily at the lights reflected in the puddles of water by the door. "Nights like tonight," she said aloud, "I'd just as soon crawl in a hole and pull it in after me."

"It would be an awful cold way to spend the night, babe," her husband, Hank, pointed out. "I'm sure we can think of much better ways to pass the hours."

Sheila Haskel balled up a napkin and threw it at the bartender, who was engrossed in the game projected over the bar. It missed. "Hey, what do you have to do to get service in this joint, anyhow?" she called loudly.

The bartender winked at her. "You know where the beer is. Come get it yourself."

"*Sheesh!*" she said as she slid out of the booth. "You just can't get good help these days." She lifted the bridge at the end of the bar, leaned in, and snagged a beer with her fingertips. "Mark me up for another one," she told the bartender. He nodded, but did not turn from watching the game.

She slid back into the booth. "I wonder if those folks up on Luna have to get their own beers."

Hank said, "They probably have robots to bring it to them."

"*Hunh!* If they're using the same programs up there that we are down here, the robots are probably even more uppity than flesh and blood bartenders."

The bartender grinned at her to let her know that he'd heard, then turned back to the game.

"What do you think of this latest 'buy North American' kick?" she asked Hank.

His lips thinned. "Part of me says it's a good thing. If we spent what money we have on stuff made here, then we're helping out our neighbors. Maybe they'll return the favor and buy something we made so we'll have a paycheck." He placed his glass carefully on the table. "But then I go and I look at the quality of the stuff being made nowadays, and I have to wonder. It's junk. Absolutely junk. They *tell* you it's good—they brag incessantly about quality being their number one job, but there's no substance to it. We got a new set," he gestured at the game over the bar, "two years ago. It's been in the

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shop . . . uh, five times, I guess. It's under warranty, but that doesn't mean anything if it's designed and built so poorly that it won't run for more than a month at a time. So now I have to come here if I want to watch something."

Carol grunted. "*That* one will last forever. It was made in Australia. My mother has one made by Walkabout. She's had the same one nearly ten years now, and it's never been in the shop."

"That's what I'm saying," Hank agreed. "I'd love to buy American, but—"

"You may not get a choice, if the President has her way," Sheila said.

"Oh God, what now?" Hank moaned.

"They're talking about not letting the Aussies sell their sets here any more. Or anything else, for that matter. Claims they're stealing our American dollars. I tell you, they're going all out on this North American thing."

The bartender groaned. They looked up to see the earnest face of a newswoman replacing the game over the bar. "We interrupt this broadcast for a Fast-Break news item. Satellite surveillance indicates that there is a major battle going on for Buenos Aires. Ground reports are incomplete, but it seems that Brazil has staged a brutal attack on the Argentine capital using both air and ground-based forces ferried across the Rio de la Plata under cover of darkness."

The newswoman's face was replaced with ghostly infrared images taken from the satellite. Bright flashes caused the image to blink as the heat output from the explosions caused the satellite's camera's electronics to overload. They would quickly recover, only to be overloaded again by the next flare. During the periods when the picture was intelligible, streets were clearly visible and structural details could be made out on the buildings.

"The attack began approximately ten minutes ago, but we have been unable to contact our Argentine correspondent for an on the spot report."

A large explosion took place in the lower left-hand corner of the image. When the image returned, half a city block had crumbled to rubble.

The voice of the announcer continued, "The attack has been anticipated for some time, based on Brazilian troop movements in the former republic of Uruguay."

The door opened and Reg Arnold stomped in, pausing to brush snow off the shoulders of his coat. He glared up at the image over the bar, then said, "I was wondering when they were going to do that. Any fool could see that they were working themselves up to something."

Behind him, the door opened again and Frank Porsovski came through, nearly running into Reg's back. "Well, hello, stranger!" he said cheerfully.

Reg turned his glare on him. "Stranger? You're the one who's been missing."

Frank just nodded at him, smiling. "Pleasant, as always, I see." He stepped around and went to the booth in the back. "Hi, folks, the prodigal son has returned."

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Sheila moved over to make room for him. "Slide in here, fella. Carol won't share, and I don't have anyone to keep me warm."

Frank raised an eyebrow. "I don't know as I'm all that warm, just having come in from outside and all that, but I'll do my best."

Reg pulled a chair from a nearby table and sat on the end of the table. "I say let the buggers kill each other," he said, hooking a thumb at the images of Buenos Aires. "Why should we care what they do down there? We have our own problems."

"Those Brazilian idiots have been cutting down their rain forest until all they've got left is a few patches. Then, all of a sudden, they start wondering why they're having droughts. The droughts and poor soil give them crop failures, and the crop failures give them hungry people, and the hungry people want a meal and a scapegoat. First it was Uruguay, now it's Argentina. Who's next, is what I want to know," Carol said.

"Either Chile or Paraguay," Frank offered. "I imagine they intend to consolidate the whole bottom end of South America."

"That should give them enough to loot to keep them happy for a while," Reg said morosely.

"Don't count on it," Frank told him. "Nothing encourages aggression like victory. If they get that far, it won't be long before they decide to take all of South America. And no stronger than most of those countries are, it shouldn't take them long to do it. Then they'll come up through Panama."

Reg stared at him. "You know, Frank, in spite of that silly smile you wear all the time, I think you're a bigger pessimist than I am."

Frank shook his head. "No need to be a pessimist when I can be a realist. Fewer surprises that way."

"So what's next, smart-ass?"

"It wouldn't surprise me at all if they came storming up through Central America. None of those countries have a decent standing army. It'd be like knocking over a row of dominoes."

"All the way to Mexico?" Sheila asked.

Frank laughed. "*Especially* Mexico. They're the first country that's worth looting. I mean, what does Nicaragua have? Nothing."

"But then they'd be at our doorstep," Sheila pointed out.

He nodded equably. "You betcha. The biggest prize of all."

She shook her head forcefully. "No way. I don't believe it. Somebody would stop them before they got that far."

"Who?" was all he said.

She couldn't answer.

"We could," Frank continued, "but we won't. At first the politicians will try talking to the Brazilians. Then they'll subside into uneasy watching. When the Brazilians cross the border into Mexico, *then* Washington will start taking this whole thing seriously."

"I still don't believe it," she protested.

"You've heard this 'buy North American' crap, haven't you?"

She nodded.

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"We're headed towards an isolationist, non-interventionist policy. We're going to stare into our navels for a spell. Meanwhile, the rest of the world marches on—literally."

Reg scowled at him. "That's why we don't invite you to more of these little get-togethers. You're about as much fun as a whoopee cushion at a funeral service."

Frank looked at him. "Reg, the reason I'm cheerful is because I use my noodle. Just before the shit hit the fan, I bought a new car so I wouldn't have to worry about it breaking down so much over the next few years. I saved money in all kinds of ways and in all kinds of places. Any moron could see that we were headed for a fall, so I made preparations. I'll grant you that I'm not exactly on easy street, but I'm comfortable. It does wonders for a man's disposition when he has something more than the proverbial crust of bread. *That's* why I'm cheerful."

"You're obnoxious," Reg said.

"I'm also right. The ability to look more than a week ahead is the rarest of human abilities. I suggest that you prepare for war, friend. It will make your life far easier this time next year."

Anyone who speaks of the silence of a forest has never been in one overnight. Roberta Lith had nearly jumped out of her skin the first time she heard a dead limb come crashing down at 3 A.M. Now she rejoiced; it meant easy pickings for firewood.

After she had seen the size of that first limb, she had moved her tent into a wide gap where a toppling tree had ripped a hole in the forest canopy, reasoning that if there was only open sky above, then nothing could fall on her.

There was a fringe benefit in that when it rained, the rain stopped when the rain stopped. Under the trees, it kept going for hours as water dripped from the limbs above. She had learned this without it even raining, as she was reading the "Boy Scout Handbook," racing to see whether she would learn something by experience or by reading it first.

The "Boy Scout Handbook" had come as a major surprise to her. She had been a Girl Scout when she was younger, but there was a vast difference between the practical outdoor advice she was reading and the insipid indoor games she had learned as a Girl Scout.

That she had run across such a practical book was pure luck. She had been browsing a used book store, trying to find anything that might be of use in the coming ordeal. She had several books on camping, two on first aid, several that purported to give recipes on how to cook nutritious meals from items found in the woods, and a book on astronomy to help her learn the constellations; she had nothing better to do at night.

The thing she wanted worst was a hot bath, but the best she could do was a washcloth and a small pot of water heated over her campfire. It was enough for basic hygiene, but it did not satisfy her craving for a full tub of suds.

She could go home. Whatever else had happened, there had always been warm water. The problem was that

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her fights with her parents had grown increasingly acrimonious. She could understand their desire to keep the family together in what were undeniably hard times. It was also clear that her meager income as a waitress was needed.

The two factors that drove her out, however, were their unrelenting hatred and resentment of the Lunarians whom she admired so much, and the fact that they clearly considered her to be incapable of making a mature judgment. That she had successfully run her own life while she was at school hardly counted; as soon as she had moved back home, she had become "their little girl" again. The implicit demotion from woman to child rankled her beyond endurance.

Bit by painful bit, she had saved her money. First by accumulating her tips, then part of her actual paycheck as she grew bolder and more sure of her plan. In the end she had left nearly three weeks before she was ready, but fortune had smiled on her and she had been able to land a temporary job as a waitress in a bar for a few weeks, more than making up the difference between the money she had on hand and her target sum.

Most of the money had gone to buy basic camping gear; a used tent, a good quality sleeping bag, and some lightweight cooking utensils. The rest she had spent on dehydrated food, something that was hard to find these days.

Once provisioned, she had hit the road, prepared to pit her wits against the entire populace of two worlds.

* * *

Lewis Cantner, president of the Crisium Business Group, was no longer as large and muscular as he had been on Earth, but he still carried himself as though he was. A lifetime habit dies hard. As soon as Anne Lister announced him, he surged into Alan's office, trailing an aura of anger.

His words, superficially polite, had a hard edge to them. "Good morning, Alan."

Lister took the other man's hand, noting ruefully that Cantner's grip seemed not to have lost any of its bone-crushing strength. "Good morning. I understand that you wanted to see me about the Door again."

Instead of answering, Cantner sat in the visitor's chair and glared at Lister for some time. Lister waited him out. Finally, he said, "You're not even considering reopening the Door, are you?"

Rather than engage in verbal fencing, Lister spoke directly to the point. "In case you haven't heard, Lewis, they're in the middle of a depression down there. The money you remember coming up through the Door just isn't there anymore. People down on Earth can hardly afford the basics, much less the luxury of spending money to come through the Door."

"Not everyone on Earth lives on the edge of poverty. There are still people with money to spend. Perhaps not as many, I'll grant you, but some. I want those people to have access to us," Cantner said heatedly.

"Fine. And what do you intend to do about those who have nothing? One Emily Starnes was enough for me, thank you."

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"Dammit, keep them out! You someone at the Door to stop people like her from coming through. That's so plain and obvious that I don't understand why you can't see it."

"How would you spot them? And on what grounds would you refuse them?"

Cantner shrugged angrily. "Call them vagrants, for all I care. Demand that they show that they have, say, one hundred dollars. If not, then they can't come through."

Lister raised one eyebrow. "I don't suppose that you remember that we are still technically subject to United States law. Granted, we aren't acting much like it at the moment, but as soon as we open the Door, we're going to have protesters, IRS agents, tourists, and possibly even the odd terrorist or two swarming through. As near as I can tell, there's only one out of those four classes of people that we would welcome with open arms. The rest of the them would be a regular *pain in the ass*, if not downright hazardous to have around. Do you not remember the bomb scare we had a year ago?"

"I remember that it turned out to be a tempest in a teapot." Cantner replied sarcastically.

"We were lucky, Lewis. That's all there was to it. Lucky. If they had actually had a bomb, and if they had known where to set it off, they could have killed a great many innocent people."

Cantner shook his head angrily. "This is all a smoke screen, Alan. What's your *real* reason for keeping the Door closed?"

Lister's face hardened. "Lewis, I've had about enough of your belligerence. If your greed has grown so great that it has blinded your common sense, then for all I care you can go bankrupt and blame it on the lack of tourist dollars coming up from Earth. The plain fact of the matter is that there are no tourist dollars to be had even if the Door were open. It is my judgment that an open Door is a greater risk than we can bear."

Cantner started forward in his seat, eyes blazing. "I can't believe I'm hearing this. You're deliberately trying to force me out of business! Your days in office are finished, Lister. No one can throw the businesses in this town to the wind, then claim in the same breath to be looking out for the welfare of Citizens."

"I can, and I will," Lister said calmly. "And it's for my job as Commissioner. I told the voters that I was only going to serve one term. That means that I don't have to give a damn about what you or any other voter thinks of me. I will do what I think is in the best long term interests of Citizens. I did not say *short* term interest. That's a politician's game. Someone was kind enough to put me in my place by calling me a politician the other day. I'm indebted to them. They reminded me where my duty lay."

"You're insane," Cantner growled.

"Perhaps so," Lister admitted. "But, in the long run, I think my ideas will prove themselves to be correct."

"Those ideas will run every business in this town into the ground."

Lister gave him a grim smile. "Then

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perhaps those businesses weren't fundamentally sound. That category wouldn't include your restaurant, would it, Lewis?"

"How dare you!" Cantner thundered, coming half out of the chair.

Lister only smiled again. "I thought as much."

"If my business fails, it's because the Crisium government won't help businesses experiencing hard times. This town *needs* restaurants!"

Lister nodded. "I agree completely."

"Then—"

"Kindly observe that I did not say that Crisium needs *your* restaurant. It only needs restaurants in the generic sense. The economic forces that create and destroy restaurants don't play favorites. The ones that are run well survive tough times, then thrive when things get better. The ones that aren't run properly . . . well. . . ." He shrugged.

"And what do *you* know about business? You've never run one."

"Running a government properly is exactly like running a business. That aside, I freely admit that I have no experience in running restaurants."

"Then by what right do you pass judgment on my restaurant?"

Lister laughed openly. "With the highest authority, I assure you. My stomach. I've eaten in your restaurant many times. Something you would know, by the way, if you ever spent time there." With a twinkle in his eye, he said, "And my experience in your restaurant tells me that the mashed potatoes are dry and tasteless, the steaks are overcooked, and you serve warm beer."

"So you're going around telling people that my food is bad?" Cantner demanded. "No wonder business is off!"

Lister shook his head. "As a matter of fact, I don't recall that I have ever discussed the quality of your food with anyone. It's not necessary. In a capitalist society people are quite capable of making up their own minds about where to spend their dollars. Apparently they're deciding not to spend them with you."

"My food is excellent!" Cantner shouted.

"Do you eat there?" Lister asked quietly.

Into the silence that followed, he continued, "Capitalism is the most democratic process ever invented. Each dollar spent represents a vote. Every time a customer buys a meal from you, he's voting for your restaurant. Conversely, if he spends that dollar at another establishment, then you're losing the election. Think about it."

"But I came to Luna because I heard that it was a good business environment—that a man could make a lot of money here."

"It's the best business environment around," Lister agreed. "Why? Because we leave businesses alone. We never step in."

"Not even to help them?"

"*Especially* not to help them."

"But—"

"There's something that few people seem to understand. To keep one person from failing, you must keep someone else from succeeding—the

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safety net they put under the failures to keep them from falling is woven from the material needed to create success. Everyone, and I mean absolutely everyone, must be allowed to succeed or fail based on their own abilities."

"So what makes you such an expert?" Cantner demanded.

Lister ignored him. "Lewis, you have the right to 'life, liberty, and the pursuit of happiness.' Note that you do not have a *right* to prosperity. That you must provide for yourself."

The first imaginings of Lunar colonies invariably showed humans living in structures constructed on the surface. Domes came to be the architecture of choice. And when colonization actually began, it was the surface structures that went up first. However, in the long run, it was clear that the future of the Lunar colonies was underground.

Tunneling, however, took time. It was also expensive. Due to the limited space available, it was second nature to every Lunarian to use that space efficiently. It was easier, faster, and cheaper to use an existing space than to excavate a new one. If the empty space happened to be laid out in such a manner that it was uniquely suited to the new use, so much the better.

The new Doors were the beneficiary of such a serendipity. They were located in what had been maintenance bays for shuttles. The shuttle business had collapsed, leaving the once thriving spaceport a virtual ghost town. With the comparatively large spaces in the port standing empty, and with ticket counters and other facilities already in place, it was the obvious choice for a thriving new transportation technology. Lunar Magnetics, owners and operators of the Holmes Door, had leased two of the erstwhile shuttle bays for Doors; one to New London, one to Besselton.

Traffic through the Doors, while not up to the levels enjoyed by the New York Door when it had been open, was good. Freight made up a smaller percentage of the overall revenue, but that was expected to rise as ease of travel allowed the three major cities to increase efficiency by specialization. Already Besselton was taking on the mantle of an industrial town, New London was the banking and financial center, and Crisium was the political center.

Mike Ordner watched Ron Abner roll a cart over the threshold of the Besselton Door and return. "You know what I miss?" he asked, once his friend was back within earshot.

"Is it pollution, crowds, or crime?" Abner asked.

"Gravity."

Abner laughed. "We've got a bit of that here," he said. To demonstrate, he fished in the pocket of his jumpsuit and tossed a coin into the air, then watched it float lazily down.

"No, Ron, real gravity," Ordner said wistfully. "The kind that keeps you in half decent shape just walking around."

"Mike, I like you, but you're an idiot. The idea of weighing six times my normal weight just does not appeal

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to me in the least. No thanks. I like things better this way."

Ordner pointed at the diagonal lines marking the threshold of the Door. "But the gravity's the same on both sides!" he complained.

Abner grinned. "Yeah, ain't it great?"

Unable to maintain his sour demeanor in the face of his friend's relentlessly upbeat mood, Ordner gave in. "You're living proof that every cloud has a silver lining."

Frowning, Abner thought it over a minute before saying, "I don't get it. How can a cloud have a silver lining?"

Ordner backtracked and said, "You've seen pictures of clouds, haven't you?"

"Well, sure, but they were always either white or kinda darkish gray. Are there really silver ones?"

Ordner's mouth opened, but no words came out for a moment. "Ah . . . no. It's just an expression."

"I don't get it."

Ordner snapped his fingers.

"Ore is found inside the stone.

Riches more than you've ever known," he recited.

"Oh!" Abner said, making the connection between the Lunarian proverb and its Earthly counterpart. "You're saying that you have to look inside the situation to find the good parts."

"Something like that."

Abner grinned wickedly. "OK, suppose I throw that right back at you. You were moping the other night about your girlfriend. Tell me where the riches are."

Suddenly on the defense, Ordner said, "There aren't any."

"Oh, yes there are. I'm not about to let you get away with this. *Think!*"

Ordner sighed. Clearly he had not expected to have the tables turned on him, and his heart wasn't in it. "Well, I guess there's the obvious. I've got a job. If I was still on Earth, I'd have been one of the first people to lose theirs after the Door closed."

Abner nodded. "Keep it up."

He shrugged. "I can't think of anything else."

"OK, you lost Susan. But the ore—the silver lining is that Ellen is probably right, it probably wouldn't have worked out in the long run."

"You don't know that," Ordner accused.

"True, but you'll have to admit that it's plausible."

"Well . . . maybe."

"And up here you're surrounded by people who are on the go. Whatever else you can say about life on Luna—it's not boring."

"That's a matter of perspective."

"OK. How about this?" He stopped on the verge of saying something and peered closely into his friend's face. "You know what your problem is?"

"Which one?"

"The only one."

Ordner raised an eyebrow. "I've only got one?"

"Yup. And I just figured it out."

"So tell me, swami, what's the secret of happiness?"

"You're lonely."

"Lonely? That's all?"

"If you had somebody to share all this with, it wouldn't seem half so bad."

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drifted to the
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husband. "Alan,
be all right?"
"Frankly? I don't
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Fiction and Fact

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"Good luck," Lister told them, and went to join Anne where she was standing in the door of the control booth, watching Jennifer Holmes and the technician patch in the jury-rigged control circuits. "How's it going?" he asked, after watching them for a few minutes.

Jenny sat back on her haunches and pushed her hair out of her eyes with the rounded pad of flesh that served as her right hand. "Better than I had hoped for. We'll be ready in a few minutes."

He nodded and watched silently as they swapped cables so that the incoming data ran through the two new boxes before it got to the computer which controlled the singularity. At last, Jenny pushed off of the floor and said, "The moment of truth."

She snapped the switch that fed power to the computer. Once it completed its internal test routines, she inserted a twenty gigabyte diskette with new software on it. Then she looked up at Alan. "Ready when you are."

He glanced at his watch, then down at the floor where the four young men were looking back at him. He stepped out to the metal railed balcony that surrounded the control booth. "Gentlemen! Get ready, please. Remember do *not* jump as soon as the Door is open. Wait until Jenny is satisfied that the Door is stable. When she is satisfied, she will tell me, and I will give you the sign. Once we reach that point, do not waste time crossing the threshold, as the singularity may drift. Trust me, you don't want to be straddling the threshold if that happens. Your job is to hit the dirt on the other side in one piece. Remember, it may be a moving target and you will weigh six times what you're accustomed to. *Don't break any bones!*"

He stepped back into the booth. Jenny asked, "Now?"

He nodded. "Now."

She typed rapidly into the keyboard with her left hand, the one with a normal complement of fingers. "Starting the singularity."

Outside the booth, on a blank stone wall, a luminous patch took on a grayish tone, then suddenly there was a tremendous thudding explosion and Lister's ears popped. The windows in the control booth heaved, but did not shatter. Down on the floor, the men were knocked sprawling by the sudden pressure surge.

Lister swallowed hard and blinked, trying to equalize the pressure in his ears. "Damn. It didn't occur to me to check our air pressure before we opened the Door. Obviously, we were a bit low compared to Earth."

The technician, cowering on the floor, looked at up him. "That was just air pressure?"

Lister reminded himself not to laugh. He nodded. "It's all right now."

The shaken tech rose to his knees and peered over the console at the Door. "Looks OK to me," he said cautiously.

"Except for the fact that we're about fifteen meters above local ground level," Jenny said tersely.

"Except for that, of course," he amended.

Slowly, surely, she guided the Door

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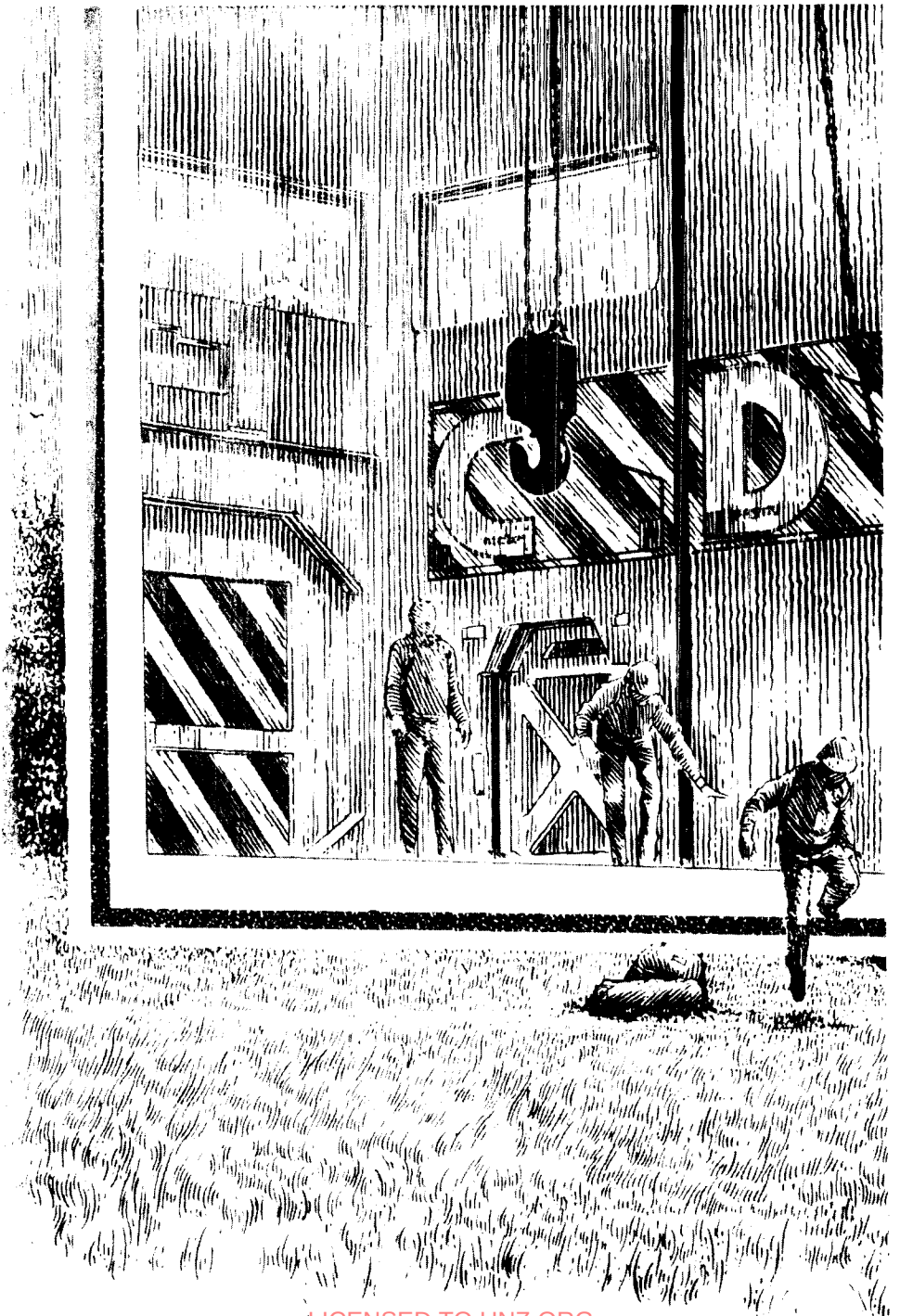

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down until the floor of the tunnel was less than a meter above the ground on Earth. She looked at Lister. "That's as close as I'm going to take it. I don't care to find out what will happen if we drift below ground level."

Lister nodded and stepped back out onto the balcony. "Gentlemen, Jenny says that's as low as she's going. You're going to have to jump for it."

Ordner looked out at the overcast sky on Earth, then back up at Lister. "Couldn't you have picked better weather?"

"We'll try to do better next time. Get a move on."

One by one, the men dropped over the edge onto the small field. They staggered a bit, but none fell. Lister made his way down to the floor and passed their packs to them. Anne followed him. They watched the men head towards the road.

"Do you realize that this is the first time I've seen a real forest?" Anne asked. "I've seen pictures, of course, but not the real thing."

Alan turned to her. "There are trees in Aldrin Park."

"That's not the . . . same." Her voice drifted off. Her eyes widened.

Behind him, Alan heard a slight scuffing noise. He whirled to find a young woman stepping high to reach the level of the Crisium floor. She huffed heavily once and mounted the step, all the while carrying her own heavily laden backpack. She almost overbalanced when she hit the lower gravity on the Lunar side of the threshold, but caught herself and made a graceful recovery.

Grinning saucily, she sauntered over towards Lister. "Is there somewhere I can put this?" she asked nonchalantly, unslinging her backpack.

Alan Lister, speechless, gaped.

The young woman frowned at him good-naturedly. "By the way, what took you so long?"

The sensations of standing were both right and wrong. This was the gravity he had been born to. It was like riding a bicycle—the reflexes necessary to stand in a heavier gravity field were there, just rusty with disuse. But his body was screaming that he weighed too much. *Way* too much.

Mike Ordner took a hesitant step away from the Door. It was shorter than he had meant for it to be. His foot weighed as much as a small boulder and it had dropped to the ground too quickly. At least he hadn't fallen.

He looked back over his shoulder at the Door. It looked, as much as anything, like a computer projection back in his tunnel. Those took place in midair too. Only it was much too large to be a projection.

He turned and reached up to accept his pack from Lister, then awkwardly swung it onto his back, trying desperately to make it look easy. It made him top-heavy, which only exacerbated his balance problems. He moved more slowly to compensate.

Well, he had told Alan he wanted a chance to say good-bye to Earth. Now he was, however unsteadily, standing in the unrelenting grasp of one full *g*. Surely, Mother Earth hadn't missed him so badly that she had to embrace him quite *this* hard on his return.

How the devil had he ever moved

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easily in this gravity?

He had studied a map of the area thoroughly as part of his preparations for this trip. Glancing around, he got his bearings and started walking carefully towards the corner of the fence that surrounded the junkyard. From there he should be able to locate the dirt road that led from the junkyard to the highway.

From there, California.

Roberta Lith sat comfortably at the table in the Lister's kitchen. She acted as though she belonged there. At her elbow was a glass of water and an empty pack of crackers. All that was left of the crackers were a few crumbs, and she was making short work of those by moistening her fingertip and dabbing at them, then licking them off.

"It looks as though you were hungry," Alan observed.

"I had a fair number of packs of dehydrated food when I started, but I ate the last one of those over a week ago. Other than that, I've been eating a bunch of berries and junk." She looked up, finger in her mouth. "And in case you were wondering, the books lie. Living off the land is anything but delicious. I dreamed of steaks. You *do* still have steaks here, don't you?"

"Well, yes, of course, but—"

"Good," Roberta said, as though that settled everything.

Alan chewed his lip for a moment before speaking again. "You realize that we can't let you go home, don't you?"

The look she delivered him seemed to indicate that she was considering the possibility that he was mentally deficient. "*Home?*" she snorted. "Who wants to go home? I *wanted* to come here!"

"But . . . why?"

"Because I've always wanted to come to Luna, Mr. Lister! Do you think I camped out in the woods for six weeks just for my health? Let me tell you a secret, it was downright cold out there, and I didn't dare light a fire big enough to amount to anything for fear that someone would see it."

"But why?" he repeated.

Roberta turned to Jennifer Holmes, who was sitting next to her. "Is this the same Alan Lister who sees all, knows all, understands all? Isn't he the one who single-handedly changed the course of human history?"

Jenny nodded, to Alan's acute embarrassment.

"Then why is the man so dense? I wanted to come to Luna. I came to Luna. I wanted a job doing something more challenging than being a waitress. So? What's the big deal? I'm here. Somebody give me an application to fill out. When can I start work?"

Rather taken aback by her single-minded determination, Jenny tried to divert the conversation. "Um, how did you know where we would be?"

Roberta tried unsuccessfully to keep from looking smug. "There was an item on the news that said that you were running short on college graduates. It was a cinch that the only place that you could get them was down on Earth. Clearly, you couldn't

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just bring in a shuttle and load up—you'd be on every radar screen in the world. It had to be the Door. So I read up on the Door. It didn't take long to realize that you needed a target. I started by looking for MASCONS, but fate lent me a hand. They ran a series on junkyards being such eyesores, and how all that steel was just rusting away for lack of running mills to put it to use. And, lo, there in the background of the second biggest was a radio antenna . . . and there was a major road within spitting distance so that you could easily move around the country as you gathered people in. But it was nice and private and screened by woods and a row of hills." She shrugged. "I figured that if you were such idiots as to miss the signal from that antenna reflecting off of all that steel, then I didn't want anything to do with you anyway."

Jenny stared at her with a half smile on her face. "Actually, it was a little more difficult than that, but you got the essentials right."

"I'm here, am I not?" Roberta announced proudly.

Jenny nodded. "Undoubtedly."

"Wait a minute," Anne said, as she placed another package of crackers on the table in front of Roberta. "Let me get this straight. You deduced where the Door would open, camped out for six weeks in the open, left your family and friends . . . all so you could come up here?"

Roberta slapped her forehead in mock exasperation. "It finally dawns on somebody. Granted, I crashed the party, and maybe I was unwelcome at that, but I really didn't expect to have this much trouble explaining *why* I was here."

"Well, you didn't exactly call ahead for reservations," Anne said as she took a seat across the table. "Now we have to figure out what to do with you."

"Do with me? Give me a job! I'll work cheap until you see what I can do. Just give me a chance," she pleaded, and for the first time the outward bravura cracked.

Alan shrugged and looked at Jenny. "I don't need anybody. My objective is to keep my government as small as possible. How about Lunar Magnetics?"

The corner of Jenny's mouth turned upwards. "Oh, I imagine we can find a position for someone with proven ability and ambition," she said dryly. "I'll ask—"

Roberta grasped her hand suddenly. "Oh, thank you, thank you, thank you!"

Jenny looked at Alan. "I guess you better get the immigration paperwork started. It looks as though it's going to be hard to get rid of her."

That things would go wrong was a given. But that they should go wrong so disastrously was not something that anyone had foreseen.

The mechanics of the operation were simple enough. Graduating class rolls at the top dozen schools gave a base list of candidates. Those thought to be the best were called. Personal calls between Luna and Earth were not rare. Many people had relatives or personal friends that they wanted to stay in contact with. The

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major difference this time was that the calls were job offers. Details to follow. And please don't mention this conversation to anyone.

In spite of the depression, many of the top-ranked graduates had already found jobs; high unemployment does not equal no hiring at all. But many were still available. Of those available, some were adamantly opposed to the idea of coming to Luna. Others were undecided. Quite a few were more than willing to come—like Roberta Lith, they were well aware that Luna represented the cutting edge, and had been planning on coming to Luna after graduation, only to be thwarted by a closed Door.

Those who had responded positively were told simply to stand by for instructions. Once the timetable had been firmed up, and the target for the Door selected, contact was reestablished. They were to gather in four groups, in four different cities. Each of the four Lunarian men who had gone through the Door would bring in one of the groups. They were each recently from Earth.

At first, things had gone smoothly. Contact had been established with the Boston group easily enough, and they had been escorted back to the Door, and so to Luna. The second group had followed shortly afterwards. Mike Ordner had gone to retrieve the Los Angeles group. They were now passing through the Door after having walked the last two miles, an easy task for those from Earth, but hard on Ordner in spite of the exercises.

Alan Lister pulled him aside after personally welcoming each of the immigrants. "We have a problem."

Ordner asked. "What's wrong?"

"John Seavey is missing. He should have been back before you, but . . ." Lister shrugged worriedly.

"He was going to Detroit, wasn't he?"

Lister nodded. "We were going to use Chicago, but he was from Detroit, so it seemed like a good idea to use a city he was already familiar with."

"Just like I lived in LA before I moved to New York," Ordner said. "You should have heard from him by now. I've been all the way to the coast and back."

Lister nodded. "I know. We were waiting for you to get back before we started to investigate."

"What are you going to do?"

"Try to query hospital computers."

Ordner shook his head. "Don't. They'll catch you. They're linked into the local police and the FBI so they can catch DNA on admitted patients on the off chance that one of them is a known criminal."

"I know. That's why we waited until you were back."

"But, Alan, if they run a bug up your line, you'll be telling them the very thing that you want to keep secret—that you're missing someone, that they're on Earth, and that they may be hurt."

Lister's eyes narrowed. "I won't leave John behind."

Ordner said, "Let me try to find him."

The wind seemed to have come directly from the North Pole. Little

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puffs of dry, powdery snow sifted down from low clouds, only to drift across the street in sinuous lines, never seeming to come completely to rest.

Mike Ordner pulled his coat closer. It had been a simple oversight. The gravity they had planned for, but no one had thought twice about the fact that the human body tends to acclimate to temperatures, too. A steady, even twenty degrees Celsius made no demands on the body. That it was winter in North America was no surprise, and he had brought a coat, but it's one thing to have a coat, and another thing entirely to have enough body heat to warm it.

Ordner was cold beyond endurance. His teeth were chattering, and he could no longer feel his feet. He needed a place to rest for a bit; someplace warm.

It was late in the evening, and few places were open, but up ahead he could see lights. The first lit doors he came to were steamed, and he almost turned in. He didn't, though. It was a laundromat, and he had no clothes to wash. It didn't seem likely that he could remain long in such a place without having an obvious reason for being there.

The next door was not so brightly lit, but the establishment was open, for all that. He pushed inside and stood huffing for a moment to fill his lungs with warm air. He hadn't noticed when he was out in the wind, but his cheeks felt stiff and numb.

He glanced around and saw the bar. Slowly, painfully, he shuffled over and slid onto a stool.

The bartender asked, "What can I get for you tonight, sir?"

Ordner made himself smile, even though it was the last thing he felt like doing. "A draft. I need something to thaw my toes."

The bartender nodded. In seconds, he produced a plastic mug. Ordner paid.

"You from down South?" a voice at his elbow asked.

His mind froze nearly as cold as his body. He had hoped to be left alone. He didn't have a decent cover. He improvised. "Sorta. Los Angeles. What they call cold there isn't anything like this."

A genuine laugh, not mocking, followed. "I guess not. It's all a question of what you're used to."

He turned and looked. Seated next to him was a man in his forties. He was evidently part of a group of five people, most of whom were sitting in a booth, but the booth was full, so he had sat on the stool nearest the booth rather than drag up a chair. The others were looking at Ordner as though they expected him to say something. Rather than seem rude, he said, "I haven't seen snow in a while. If it weren't so cold, it'd be pretty."

"*Huh!*" grunted another man seated in the booth. "I'll tell you about cold—cold is having to turn your heat down lower and lower every month because you're getting behind on your payments and every degree puts you deeper in the hole. I can't win. If I don't turn on the heat, then I have to leave the water going so the pipes won't freeze, but then the water bill comes in higher."

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The man seated next to Ordner leaned closer and said, "Pay no attention to Reg. He's our pet pessimist. Any time we get bored, we wind him up and let him tilt at Frank."

"I take it that Frank is your pet optimist," Ordner said.

Another man in the booth nodded, smiling. "I'm not exactly what you'd call an optimist, but I get by well enough."

"He's just lucky, made some lucky guesses," Reg put in sourly.

"Fortune favors the prepared mind," Frank quoted. "I made my own luck."

Reg cursed under his breath. "I'd like to see how his luck held up with no job."

The man named Frank looked Ordner over carefully, "Reg lost his job watching the assembly line robots when they shut down the GM plant. Myself, I looked at the way things were going, quit my job as a supervisor at the same plant, and got a job managing a grocery store. The man who took my position at the plant lost his job a full two months before Reg lost his because they started cutting from the middle first. Granted, I took a cut in pay, but my current job seems pretty steady. People always need groceries."

"What people need are *jobs*. I've got a right to go to work," Reg said, thumping the table with his fist for emphasis.

For the first time, Ordner felt compelled to speak. "I've heard that before—about having a right to do a job, but I've never understood it."

Reg frowned at him as though he were speaking nonsense. "Why, I worked at that plant for nearly twenty years. There's no telling how many cars I've built for them in that time. They *owe* me!"

Ordner blinked, confused. "Are they holding your last paycheck or something?"

"No, of course not! But when a man works for a company as long as I did, you expect to be treated with a little more respect. They could have held on to us until things got better. Hell, as much money as GM has, they could have carried the whole plant for ten years and never felt it."

After thinking back for a moment, Ordner replied, "I thought I heard that GM had lost money for something like ten consecutive quarters. They couldn't keep that up forever."

"If they were losing money, then how did they keep paying us?" Reg demanded angrily. "When I took the check to the bank, it was good. GM's got more money than they let on."

Ordner started to launch into an explanation of cash flow versus profit, but stopped. Instead, he reached into his pocket and brought out a crushed wad of bills, probably thirty dollars. He leaned over and tossed it in front of Reg, smiling. "Take that. Turn up your heat. It's too cold a winter for you to be living without heat."

Reg stared at him for a second, unsure how to react, then slapped the table with his palm. "Bartender!" he shouted. "Bring me a drink!" He looked down at the money, then back up. "Make it a double."

Frowning, Ordner opened his mouth to protest. After all, he had in-

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tended the money to help pay for the essentials, but Reg was spending it on alcohol. The futility of saying anything caused the words to die on his tongue. Sudden insight flooded over him, leaving him feeling once removed from the conversation. Belatedly, he realized that he was hearing his father's story all over again. Lessons in basic economics would be lost on Reg. His spending habits were already deeply ingrained. He was frustrated, hurt, and desperate to strike out in his pain. That much was obvious. The part that astounded Ordner was that he was seeing the man through Alan Lister's eyes.

The feeling faded, leaving him with a lingering sense of unreality. Turning slowly back to the bar, he drained his mug, then stood. "Ah . . . good evening, folks. I need to be getting along."

With that, he shuffled out the door into the snow. Distracted, he turned the wrong way, realized his error and reversed his course, nearly bumping into Frank as he came out of the bar.

"Mind if I walk with you?" Frank asked.

"Um, no," Ordner replied, some small part of himself resenting the intrusion.

"He's dead, you know," Frank said after they passed the laundromat.

"Dead?"

"John Seavey."

Ordner stopped so suddenly that Frank took an extra two paces before turning to face him. He held up his hands, palms outwards. "I won't hurt you."

"Who are you?"

Frank sighed. "I recognized your face from the news. I figured that there was only one thing that would bring someone from Luna here, and that was to find Seavey. He must be late, overdue or something."

"But—"

"It was in the news locally, but you probably haven't had time to go to a library."

Ordner shook his head, shocked. "I never thought to check the news. I started with the hotel, trying to trace his movements."

Frank smiled sadly. "And the one thing you couldn't do was ask the police for help."

"What happened?"

"I gather he was here to pick some people up." It was a statement, but inflected as a question.

"Yes," Ordner whispered, unsure whether it was wise to admit even that much.

"Apparently, someone among the group he was to pick up talked. Word got out that Luna was staging a raid. At least, that was the way it was phrased. As you can tell from listening to Reg, there are a lot of angry, bitter people around. Some of them blame Luna. A band of them decided that they would stage a reception for Seavey. They caught him out on the street Tuesday night. There was a scuffle and somebody had a gun. It wasn't hard to identify the body . . . and, no, they haven't caught the man who pulled the trigger. I don't think they're trying very hard."

Ordner stood, snow blowing gently into his face, for nearly a minute. Then he quietly said, "Thank you,"

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and began walking down the street once more.

He'd made ten paces before he heard Frank Porsovski's voice call, "Mike!"

Ordner stopped and slowly turned back to face him.

Hands outspread as if in supplication, Frank asked, "Can I come with you?"

Alan Lister walked the corridors of Crisium alone that night. The city wasn't quite large enough yet to sustain perpetual night life, and he stayed away from the few businesses he knew to be open late.

Without consciously planning it, he found himself visiting the places that held the most important memories of his life. The tunnel on the outskirts of the fourth level where he had lived as a child; Aldrin Park, where he had broken his arm falling out of one of the trees after seeing Earth boys climb one in an old style movie; the first tunnel he had rented when he was just moving away from home....

He was the titular head of the oldest human colony on Luna, and as such, the person the citizens looked to when they expected leadership. To be a leader, you had to be strong. To be strong meant that you had to maintain an external image that would inspire confidence.

When he had told Janice Seavey the news that her husband was dead, he had watched her face. First there was shock, a numbed disbelief. Then a short-lived panic reaction that this couldn't be happening—that there must be some mistake. Seconds later the grief hit in an overwhelming tidal wave and she broke.

He had held the young widow to try and comfort her, then called one of her friends to stay with her for a while. When the friend arrived, he left.

And started walking.

He had been walking for over five hours now and had yet to escape the guilt . . . or find a way to rationalize it down to a bearable level.

He had sent John Seavey to his death.

Hindsight told him that he should have foreseen the possibility of violence. Clearly, there were people on Earth who hated and resented Luna and all that it stood for. Whether he thought that their reasons were justified was not the question. They felt that way and would react accordingly.

How naive he had been to think that they could gather ninety-three people from Earth without one of them talking to someone who held a grudge! Once one talked, it took little to predict that extra precautions should be taken; that the semi-secrecy that they had adhered to would not be enough.

It took another hour before he could make himself face the fact that pride had been his undoing. He had fallen prey to the conviction that Lunar life was so clearly superior that anyone in their right mind would jump at the invitation to come to Crisium. So often he had cautioned others against the same conceit, only to find that it had been hiding in him-

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self all along.

And John Seavey had died for it.

He found himself deep in the bowels of the city, in the newest level. Aware for the first time of where he was going and why, he sought out the small alcove where it had all begun a little over a year ago.

The walls were still bare rock. Originally, the level had been scheduled to open for limited use two months previously, but the closing of the Door had stopped the flood of immigrants. With the difficulties they had had keeping fresh air in the inhabited levels above, work on the new level had slowed to a crawl.

He left the light in the main corridor on, and made his way down a dark side corridor, then into the tiny tunnel where Emily Starnes had died.

There was no question that it had been one of the turning points of his life. Looking back, he could see that it had been so for the entire human race. The question was where to go from here. If they were to turn, then what would they turn to? What would make John Seavey's death count for something?

He sat on the cold stone floor with his back against the wall, knees drawn up, hating himself. What he needed was someone to lean on, someone who could perform the same function for him that he did for others. With any other problem he would have talked to Anne, but this was too deep, too personal even for that.

After a while, he laid his forehead on his arms and cried.

There was a deceptive lull in relations between Luna and Earth. News of John Seavey's death was accepted by Lunarians with more equanimity than expected. The immigrants were welcomed and put to work. Life quickly settled back into a routine. Earth, for its part, seemed not to regret the manner of Seavey's passing. The Chicago Tribune *even went so far as to suggest that it evened the score between Earth and Luna—John Seavey for Emily Starnes. While the paper was publicly criticized for printing the editorial, a poll later showed that most people privately agreed with the sentiment. Oddly enough, the fact that over sixty people had spontaneously emigrated from Earth to Luna was never mentioned.*

Alan Lister, however, was not idle. He worked as a man possessed. Taking time only for the most essential of matters, he was often seen engaged in conversation with Commissioner Hammond Kent of New London, known to be one of his closest and most trusted friends. Commissioner Carolyn Brewer of Besselton was also invited to Crisium for a week. A reporter asked her what had been discussed after she returned to Besselton, but she declined to comment. He later wished he had been more aggressive in following the story.

Several of the smaller outlying communities sent representatives, but that was only discovered later. At the time they slipped in and out unnoticed.

One of the reasons that they were paid little heed was that the news from Earth began to take a more omi-

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nous tone. Brazil paused for a short while to digest Argentina, then swiftly took six countries in five weeks. Aided by the fact that most South American countries had next to no military, they proceeded to absorb Chile, Bolivia, Peru, and Colombia almost overnight. Paraguay and Ecuador gave up without a fight, rather than face decimation by the seemingly unstoppable Brazilian army.

Mexico sent a small force to back up Panama, as the potential loss of the newly widened Panama Canal was regarded as serious enough to warrant the expenditure, even in such financially strapped times.

Brazilian forces overran Panama in nine days, leaving nothing more than blood-soaked ground where the Mexican soldiers had stood. With the clarity of hindsight, the diminutive size of the Mexican force only seemed to send the message that the Panama Canal was not regarded as an asset worth defending—thus inviting the Brazilians to act.

When fast-attack armored regiments began to mass for an apparent attack on Costa Rica, Mexico and the United States finally sent more substantial military units. The narrowness of the geography funnelled the fighting down into a limited area.

It was later said that what remained of the regional rain forest after the battle could have been watered by a single raindrop. While clearly an exaggeration, it was a fact that the few trees left standing were regarded with near superstitious awe by the locals after loggers had found it nearly impossible to cut them down—there was too much metal shrapnel imbedded in the wood; saw teeth shattered on contact.

The thing which sent North Americans into sheer panic was the fact that Brazil won the battle, albeit at terrible cost. Slowly but surely, they resumed their northwards advance.

With political tensions on the world beneath reaching a fever pitch, Alan Lister, Hammond Kent, and Carolyn Brewer made their announcement. . . .

Edgar Rice was caught napping, just like everyone else. The only difference was that he was among the first to discover that a news blackout was in effect.

For most Lunarians, the sudden loss of communications with Earth was regarded as a nuisance, nothing more. It did not occur to anyone that it might be intentional, so they went about their daily lives blithely assuming that the newsnet would be up in time for them to catch up with the latest from Earth over dinner.

Edgar Rice, however, quickly found out otherwise. He was at his desk writing the editorial for the next day's news when a small warning icon appeared in the lower corner of the screen's projection warning him that there was a communications loss with Earth.

Since the war was the subject of his editorial, he became irrationally convinced that something would happen while he was out of touch that would invalidate his entire thesis. He instructed the computer to

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call the technical department so he could inquire as to what time they expected to have the glitch solved. When no one answered, he assumed that there was a big enough problem that it required the attention of both of the staff technicians. On the off chance that there was a story in the communications failure, he then left his cubicle to find them himself.

The small workroom where the technicians usually stayed was empty, so, frowning, he dropped by the secretary's desk to ask if she knew anything about the communications problem.

As soon as he rounded the corner and saw her, he knew something important had happened. She was staring at the display over her desk as though her life depended on it.

"Edgar!" she gasped, as she saw him out of the corner of her eye.

He hastened over to see what was the matter. He arrived within the field of view in time to see Alan Lister's haggard image say, "... and in light of the events of the last year, I say that it is time that we take a serious look at what we, as a people, want to accomplish with our lives. With that in mind, I am asking that each and every one of you take today and tomorrow off. Think this over. We will be taking a vote on Friday to see how all of you feel about it. If enough of you vote for it, then we will make the announcement to Earth late Friday night or early Saturday. I'm sorry to spring this on all of you this way, but we wanted complete secrecy as far as Earth is concerned. Thank you for your attention." With that, Lister's image disappeared.

"Thank you for your attention," the secretary whispered. "He... I... good God, he acts so apologetic, like he's not just dropped the bombshell in our laps that—"

Rice shook her shoulder gently. "Darlene, what did he say?"

She stared at him, eyes wide. "You didn't hear?"

"Only the last part."

"Lister wants us to declare independence from Earth. All of us. He's putting it up to a vote on Friday to let us...."

Her voice trailed off. There was no point in continuing when Rice was already half way back to his desk.

He skidded into his cubicle, literally sliding across the floor. His fingers danced over the keyboard, instructing the computer to dump everything that he had been working on and to clear all memory.

The first thing that he had to do was get to Alan Lister and get to him quick. The problem was that half of the city would be trying to do the same thing. He had a better strategy than most, though. Instead of calling Lister's listed office number, he called his home number, knowing that he'd get Anne, and that he could sweet talk his way past her to her husband.

As he waited for her to answer, he caught sight of his hands. They were trembling.

Independence.

Hot *damn!*

As soon as he could get away from his desk—he had had to file at least a token editorial column for the eve-

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ning news—Edgar Rice had hurried towards the nearest set of ramps. Two levels down and halfway across the town, he turned into the last corridor and stopped dead in his tracks. He had to. There were people jammed wall-to-wall.

Over the heads of the crowd, he saw Samuel Watts, chief of the Crisium police force, lounging casually against the frame of the portal into Alan and Anne Lister's tunnel.

He began edging his way forward, gently slipping an elbow between people, then using it as a lever to open a path. He'd been a newsman too long to let something like a crowd keep him from reaching his objective.

He caught Watts watching him with the vaguely condescending amusement large men feel towards smaller men who find their strength overmatched. But where physical power failed, pure force of will succeeded. In short order Rice was huddled against the wall next to Watts.

"I've never seen so many people crammed into such a small space," he said.

Watts beamed down on him. "Yeah, I know what you mean. I ought to run every damned one of them in for obstructing traffic. Maybe fire hazard. They're taxing the air system, for sure."

"Somehow, I don't believe you're going to do it."

Watts shrugged cheerfully. "They'd be even more crowded in the jail than they are here. Might as well leave 'em be. At least they're happy."

From an open portal across the way, someone leaned out into the corridor and shouted, "Seventy-three!" His voice was drowned in cheering.

Rice looked up at Watts. "Percent?" he shouted over the noise. Fortunately, it quickly subsided to a more normal level.

Watts nodded. "Still a ways to go, though. The last time I looked, the computer was still showing less than half the voters as having done their thing, but it looks as though we're going to cut loose from Earth."

"How do you feel about it?"

Watts looked at him. "Is this for publication, or are you just asking?"

"Both."

Watts chuckled. "Hell, I don't suppose it matters, one way or the other. I'm for it, but not quite as loudly as all these folks." He gestured to include the revelers in the corridor, accidentally bumping someone's head. "Sorry."

The woman just smiled and nodded, then went back to talking to her companion.

Rice glanced into the Listers's tunnel, but it was only dimly lit and he didn't recognize anyone. He turned back to Watts. "I take it that you're the doorman."

"Or bouncer, yeah."

"Should I tip you, or is there a secret password?"

Watts laughed. "It's entirely arbitrary. I get to pick and choose who I want to let in there. It depends on whether I like them or not."

Rice looked apologetic. "I'm afraid that I'm not the kind of guy who shows up on peoples' most-liked lists,

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and I don't know today's password. So I'm reduced to begging. Pretty please, with sugar and cream on top, Officer Policechief, will you escort me to pass yonder sacred portal?"

Watts adopted a stern look. "Edgar, are you drunk? You're acting like a fool."

"Alcohol, my dear sir? I'll have you know I'm drunk on freedom, the strongest intoxicant known to man. As for acting like a fool, I'd suggest you wipe that salty residue off of your face before someone sees you and the sentimental fellows you really are."

"I'm not joining," Watts insisted, then shrugged. Sheepishly.

Rice shook his head sadly. "I thought the officers of the law were supposed to remain poker-faced at all times. Here you are, making a public spectacle of yourself."

Watts rolled his eyes. "Get inside, Edgar. If my reputation is to be ruined, I'd rather do it myself than have you do it for me."

Rice grinned and slipped in. The room was dark; the only illumination came from the *last* wash of *light from* the computer screen projected against one wall. It had been blown up to maximum size, two meters high by three wide, and showed the real-time feed as the vote was tabulated. Both charts and local numbers reported the percentage of people voting for and against the proposition for independence. A small inset in the bottom corner of the screen kept count of the percentage of qualified people who had voted so far.

The tunnel was crowded; the air was stuffy. He had noticed that the portal had been jammed open—a flagrant violation of municipal safety codes—in an attempt to assist the air circulation. The ventilation ducts whistled faintly as fresh air was blown in.

The couch had been pulled away from the wall, out into the center of the room facing the screen. Several people were seated in it, and Rice thought he recognized the back of Man's head. Sam's for certain, but could not tell who any of the other people were.

Watts had done a good job of winnowing the crowd in the tunnel. There were still clearly too many people, but it was a relative improvement over the situation out in the corridor. Rice slipped sideways between two men he did not know and came up behind the couch.

"Well, Man, what will you be doing for an encore?" he asked.

Man twisted to look up at him. "Encore? I didn't know I needed one."

"I was thinking perhaps that you could run for Emperor of Luna."

Sam turned. "I'd veto that, Edgar. Being Commissioner of Crisium has taken enough of a toll as it is."

"Perhaps another term as commissioner?" Rice persisted.

Man shook his head. "No way. I promised everyone that I would be [illegible] term only. You're stuck with me for a little bit longer, but then I'm going into hiding."

There was a disturbance at the portal behind them. "Let Man invited me—told me to come," a man's voice shouted.

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Rice looked back and saw Watts effectively bar the portal by the simple expedient of locking his arm against the opposite side. "Sorry, Mr. Cantner, but I can't allow any more people in there. City ordinance, you know. We can't take a chance on overloading the ventilation system."

Rice looked back at Alan just as he said, "I wonder what *he* wants. Surely, he wouldn't pick this particular instant to harangue me about reopening the Door to New York."

"So will you?" Rice asked.

"What? Open the New York Door? Of course. There was never really any question whether we would, it was only a matter of timing and control. If nothing else, it will be the best interim solution to getting a good education for our kids."

"I think that there's more to it than that," Anne put in. "I think it's good for them to have ties with Earth. The best way for them to do that is to live there for a while. If nothing else, it broadens their horizons."

"And corrupts their minds with airheaded twaddle," Alan groused. To Edgar, he said, "Anne has a point, of course. I don't really want to cut all of our ties with Earth, but there are real problems down there, and a lot of what's wrong is contagious, in a manner of speaking. Bad attitudes, bad spending habits, just an all-around screwed up way of approaching life. So while there's no denying that Earth is much, much richer, culturally speaking, we must be alert to the fact that there's a downside. We don't want to end up repeating their mistakes."

"Mistakes like Emily Starnes?" Rice prompted.

"Emily Starnes, as a person, was not bad. She simply had the misfortune to be born into a time period she wasn't equipped to handle."

"I didn't mean her, per se, what I was getting at was the Door. Will you be implementing immigration restrictions, visas, and the like?"

Alan sighed. "I don't see how we can avoid it."

"Earth won't like it," Rice observed.

"They won't like it if we declare independence, either, but there isn't any economical way that they can enforce their will on us. We have control of the Door on this end, and trying to bring us under control using shuttles would cost them a lot of money that they can ill afford. I'm sure that the sentiment is there, at least in some circles, but I'm not so sure that they have the hard, practical ability to put those peoples' will into effect."

At the sound of a feminine voice behind him, Rice turned to see Jenny Holmes slip through the portal. Watts was bowing her through with exaggerated politeness. "Good evening, Miss Holmes. Please, step right this way."

As soon as Jenny was inside, Lewis Cantner's angry face appeared at the portal. He was shouting at Watts. "I saw that! You let her in."

Watts nodded, unperturbed. "I sure did. Someone left just a second ago, so there weren't as many people inside. Now that Jenny's here, the tunnel's full again."

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"Liar!" Cantner screamed. "I was watching. Nobody came out. You just—"

Watts was grinning, obviously enjoying himself hugely. "You must have blinked just as they were leaving, Lewis."

Jenny made her way to the couch, casting worried glances back over her shoulder at the confrontation at the portal. "Shouldn't we call the police, or something?" Then she realized the absurdity of what she had just said. "I guess that's pretty silly, Sam *is* the police."

Alan shook his head. "It's about time somebody gave Lewis a dose of his own medicine."

Jenny looked back at the feuding pair once more. "God, this place is getting to be just like Earth. What happened to the frontier spirit where we were all in this together?"

Alan's face went very still.

Anne, seeing his expression, nudged him. "Penny for your thoughts, mister."

He answered slowly, absently, "Jenny just clarified my thinking for me. I've been feeling vaguely dissatisfied for a while, and I couldn't put my finger on it. We're getting too big. We're shucking off Earth's bureaucracy just in time to develop our own. I don't want to be a part of that."

Rice frowned. "But you're not. You run what has to be the leanest, tightest government known to humanity. It's just you and Anne, and Tim Smallwood, and a few others. I don't see how you could possibly say that it's too big."

"It isn't . . . yet. But it will grow whether I want it to or not. For starters, I know nothing about opening a university, so I'd have to hire someone to handle that for me. In no time, what was a tiny municipal government will become a bloated national government."

"Even if that's the case," Rice said, "it'll still be better than what we had on Earth."

"Maybe so, but I don't want to be a part of it. This is a time for people like Thomas Jefferson and George Washington. And I'm not that kind of man."

"So who do you think you are?"

Alan stared into the distance for a moment. "I think I've just realized that I'm more like Daniel Boone. The neighbors are getting too close—it's time to move on."

"What are you going to do? Start a new town?"

Alan shook his head distractedly. "That would just prolong the inevitable. No, I think the solution is more. . . ." His voice trailed off and a quirky smile came to his lips. He turned to Jenny and said, "Tell me something. Can you design a Door powerful enough to get me to Mars?" ■

(Editor's Note: This story is a sequel to "Darwin's Children," which appeared in our October 1993 issue.)

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The Magic That Works: John W. Campbell and the American Response to Technology, Albert I. Berger, Borgo Press (P. O. Box 2845, San Bernardino CA 92406), 330 pp. (ISBN: 0-89370-175-0), $20 pb (ISBN: 0-89370-275-7), $24 hc.

Turning Points, Andre Norton, DAW, $3.99, 267 pp. (ISBN: 0-886-77258-2).

Brother to Shadows, Andre Norton, AvoNova-Morrow, $20, 311 pp. (ISBN: 0-688-12758-x)

The Chronicles of Pern: First Fall, Anne McCaffrey, Ballantine/Del Rey, $22, 307 pp. (ISBN: 0-345-36898-5).

The Aliens of Earth, Nancy Kress, Arkham House (Sauk City, WI 53583), $20.95, 327 pp. (ISBN: 0-87054-166-8).

By Any Other Name, Mike Resnick, ed., DAW, $4.99, 316 pp. (ISBN: 0-88677-[illegible]).

Dancing with Myself, Charles Sheffield, Baen Books, $4.99, 366 pp. (ISBN: 0-671-[illegible]).

Vanishing Point: The Mystery of Extinctions, Jeff Hecht, Charles Scribner's Sons, [illegible] pp. (ISBN: 0-684-19331-0).

Books [illegible]

[illegible] this magazine, he did an immense amount to shape the field of science fiction and its writers, and his many letters offer unique access to his mind. Happily, he wrote more than letters. There were fiction and nonfiction and his notoriously opinionated editorials. There are also the memoirs of those who dealt with him. And Berger has been able to use these other resources to produce a very interesting book: **The Magic That Works: John W. Campbell and the American Response to Technology.**

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The book is by no means a biography. There is very little mention of the details of Campbell's personal life. There is considerable coverage of highlights of both Campbell's and *Astounding/Analog*'s publishing careers, including a prolonged discussion of their run-in with the FBI over whether Cleve Cartmill's "Deadline" represented a breach of Manhattan Project security (Berger used the Freedom of Information Act to see Campbell's FBI file). Much more emphasis goes to Campbell's intellectual history and his place as a quite typical American of his time.

Let me try to capture a taste of Berger's argument as much as possible in his own words: Campbell had a "joyously cantankerous appreciation of argument, for its own sake and entertainment value, and for what he believed to be its utility" (p. 196). Much of his argumentative energy he focused on the relationship between society and technology. His—and the magazine's—audience was "the large new class of people whose educations and skills might have once made them independent, self-employed professionals, but who were now simply very highly paid, salaried employees living in large cities and their suburbs. . . . [B]y the time of [Campbell's] most explicit and radical right-wing political expressions, the life of the intellect had very largely been subordinated to its existence within [large bureaucratic] enterprises. . . . [Where traditional workers turned democratic, these turned elitist], antidemocratic, authoritarian.

"Campbell's editorials demonstrate all of that. . . . [Both he and the readers] remained loyal to the social structure which had originally given them any status that they had had, even as that social structure was changing and destroying their status in the process. [H]is elitism, his antipathy to the aspirations of non-white peoples, and his general conservatism [are all] visible throughout his career [and showed in] the increasingly shrill tenor of his editorials. . . ." (pp. 185-6).

"If his crabby, malcontented views of science and society became simply obtuse and brutal at the end, that was because he had worked himself into an intellectual corner with his increasing rejection of the role of scientific theory, of the place in the modern American social structure occupied by established, organized science, and of the role people he applauded occupied in both science and society. In his own lifetime, he was reduced to a crank, protesting futilely against a system in which he and those like him were reduced to a genteel subordination, no matter how well paid." (p. 191).

Anyone who loves the memory of Campbell's magazine will surely find Berger's evaluation hard to accept. Yet Berger develops his case persuasively, and in the process he gives due credit to Campbell's real contributions, and not just in SF. For one thing, he notes that much of what Campbell was saying can be read as parallel to Thomas Kuhn's more widely known thoughts on scientific revolutions and paradigm shifts. Unfortunately, says Berger, Campbell "never seemed to

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realize just how revolutionary his propositions were within the contexts of the intellectual and social establishments he was criticizing, and continued simply to beat the scientific and political establishments verbally over the head. . . ." (p. 144).

If you are now reaching for a rock to throw at me or Berger, you will surely find this one a fascinating read. If you are thinking, "Yes, yes, that's the Campbell I recall," it won't stir your juices in the same way, but you too will surely find it interesting for the way it puts Campbell, *Astounding/Analog*, and science fiction in a broader social context.

Dogs don't make good models for aliens. They're too human, for they give every impression of existing to please their masters.

Cats, on the other hand, *are* alien. They have their own inscrutable agendas, and they don't fawn—indeed, they give every impression of thinking that we exist to please them.

Perhaps this is why we see so many felinoid aliens in SF. They are a cliché trotted out by every author who wishes his or her readers to break out in fuzzy-warm sympathy without going to the trouble of genuine characterization. When you see a book cover with a catty looking critter dressed in futuristic garb and holding a blaster, you therefore expect relatively little originality.

If you buy the book anyway, you aren't often disillusioned, just as you won't be if you buy Lisanne Norman's **Turning Point.** Norman writes fairly well in the sense that the story moves right along without stumbling on details, but it is liberally infested with clichés. The felinoids are only the one that shows on the cover. Once you get past that you find villains whose villainy is obvious in their lack of foreheads and their use of human women as sex toys, twins who are linked by telepathy to the extent that one feels the other's pain, and more.

The setting is the world of Keiss. Shortly after it was colonized by humans, the slope-browed Valtegan meanies invaded, taking it over as an R&R planet. The humans are now peasants, whores, and resistance fighters.

The twins are Elise and Carrie, who feels Elise's pain. Elise goes to the pleasure city as a spy, is captured, is tortured, and dies. Carrie nearly dies as well, but she is fortunate. A scoutship loaded with felinoid Sholans has just been shot down. An injured survivor, also telepathic, senses her mind and involuntarily provides a replacement bond. In due time, the felinoid, Kusac, reaches Carrie's backyard. She finds him and nurses him back to health, while everyone else takes him for a wild forest cat. At the same time, Carrie is feeling pressured by the men around her, who seem to think she should be a good girl and dedicate herself to breeding a new generation of Valtegan slaves and/or partisans.

She runs away to join the resistance. But before she can get very far, Kusac reveals his sentience and tells her there are others of his kind on Keiss, trying to reach an equipment cache that will let them call for help

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and knock the Valtegans on their Keiss-ter. If they fail, their own species is in danger, as is the second human colony ship due in the next few weeks, and then Earth itself.

And they are off, with Carrie destined to discover immense paranormal talents even as she learns that the bond between her and Kusac is so deep and strong that if they belonged to the same species, they would be passionate lovers indeed.

The outcome of the situation is in doubt in only one way: Will their passion breach the line of interspecies inscrutability or not?

Fans of Andre Norton will be delighted to hear that she has a new novel out. It's **Brother to Shadows,** and it is vintage Norton.

The tale is set on a distant world, home to an assassin cult whose local heads derive their power from a mystic stone; when it stops glowing, the chief and his aides commit suicide. The rest of the local "Shadows" are disbanded by the priest or Shagga to other Lairs. Jofre, however, is an offworlder orphan, rescued from a spaceship wreck and raised by the assassins. He is young but skilled; he is also hated by the Shagga, and when his patron dies, the priest banishes him. Off he goes, through the wilderness, heading toward his world's one spaceport. On the way, he stumbles upon a dead Lair, thoroughly taboo, and finds a stone that might be akin to the stones that give Lair chiefs their power. The Shagga, watching, is enraged and becomes determined to destroy the boy.

But as soon as Jofre reaches the city, he befriends a Zacathan. Soon thereafter he is offworld, bound on a mission to probe the past with an experimental time-viewer. His foes must enlist the Thieves Guild, who have their own designs on the Zacathan and his device. They also try to set a Sister Shadow on the boy. Meanwhile, just to confound the issue, a dictator kidnaps Jofre, Zacathan, and viewer to help him celebrate the anniversary of his coming to power.

Of course all ends well. The dictator stumbles. Jofre survives. The Zacathan succeeds in his quest. The Guild stands defeated for awhile. The Sister Shadow becomes an ally and companion. So does the obligatory warm, fuzzy, telepathic animal—I said it was vintage Norton, didn't I? It's vintage indeed, and it has a great deal of the traditional Norton charm. Yet it seems fair to say the vintage is a bit past its prime; charm alone is not enough to make Norton's familiar formula feel fresh.

Fans of Anne McCaffrey's Pern series will be delighted to spot **The Chronicles of Pern: First Fall** on the bookstore shelves. The five stories within its covers tell us about the early days of the human relationship with the planet, beginning with the survey that shrugged off a few minor anomalies and marked it as suitable for colonization while tossing out a hint that Thread or something very like this pseudo-fungus scourge may have been responsible for sterilizing other worlds. "The Dolphins' Bell" relates the later colony's encounter

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with Thread and its desperate flight from the southern continent to the northern to escape a volcanic threat as well. The establishment of the holds is the meat of "The Ford of Red Hanrahan"; that of more weyrs than the first is told by "The Second Weyr," which also includes the coming of a young woman (Torene) into her adult powers of potency, responsibility, and duty, a common feature of McCaffrey's stories. The last tale, "Rescue Run," first appeared in this magazine; here we see a Federation space cruiser passing near Pern, receiving a distress signal, visiting, finding Thread in space, and discovering a single small hold remaining on the southern continent. The hold is ruled by an autocratic patriarch whose guiding principles are power, greed, and safety; not for him—nor for those he rules, no matter what they might wish—the path taken by the other colonists, who embraced their situation and learned to thrive.

In her recent novels, McCaffrey has struck me as far too prone to excessive sentimentality or emotionality—the "Ooo! Ooo!" school of melodrama. Here the handwringing seems much more under control. The edges are harder, if you will, and the stories are much more satisfying.

Every so often, Arkham House brings out a collection of some high-profile author's shorter works. The latest such author is Nancy Kress, who has won both Hugo and Nebula awards and whose novels tend to be quite well received.

Her Arkham collection is **The Aliens of Earth,** and it displays to good advantage her strengths. She is thoughtful, perceptive, and prone to a quirky originality that sometimes leaves us groping after her punchlines.

One of my favorites here is "The Price of Oranges," in which an elderly modern has found in his closet a doorway to the 1930s that supplies him—and his park-bench friend—with affordable food and other goods. It seems only natural that he mug a nice fellow of that other time, haul him forward, tell him of all the horrors that await in history, and introduce him to his aggressively feminist writer daughter. The outcome is a nice example of Kress's quirkiness.

I found very interesting the ambitious "And Wild for to Hold," whose society is built upon the taking of hostages to ensure peace. Researchers find they can identify historical figures whose existence seems to lead toward war; by taking them hostage too, they produce peace—but not in history, for they have no access to time, only to parallel worlds.

Another favorite is "To Scale," in which a social misfit who has filled a basement room with a labyrinthine tenement of dollhouse miniatures discovers that he can exploit his rage to install living people in the maze. Still another is "In a World Like This," whose no-periods beginning made me hoot; it plays people who must have explanations for every little thing very nicely against the uncertainty of information.

I liked less "Craps," which is in-

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formed by a preoccupation very similar to that of "In a World Like This"—its protagonist, Charlie Foster, thinks he is experiencing miracles—but does not convince as well. Several other stories left me pretty cold, but even then Kress's hand remained something to admire.

Of course, tastes differ. You may well not like at all the stories I liked best. But you will surely like enough of them, and find enough more of interest, to make the book worth buying. Kress is good.

The collection's greatest defect is that it lacks an introduction and story notes of any kind. If you lose the dustjacket, you lose every hint of what the book contains. This isn't necessarily bad—good short stories should and do stand alone—but it does mean that those who crave a bit of context or a few words from the author about herself or her work will feel deprived. It also means that those who have no previous acquaintance with Nancy Kress are less likely to discover her by cruising bookstore or library shelves.

Awhile ago, Mike Resnick came up with a pretty nifty variation on the "alternate history" idea, sold DAW on it, and asked writers for stories that consider what celebrities might have been like if their lives had turned out differently. Now, this is not of course an entirely new idea, for similar alternate outcomes have always been part of alternate history stories (certainly it was part of his *Alternate Presidents*). But this is the first time—I think—that it has been made the starting point for an anthology.

The book is **By Any Other Fame.** Is it science fiction? Who cares? It's certainly that old "What if?" game, and it's a delight, with enough gems among its twenty-three stories to make the book well worth its price. Barry Malzberg's "Allegro Marcato" is an affecting treatment of Arturo Toscanini as a baseball manager. "Dance Track," Mercedes Lackey's and Larry Dixon's tale of Isadora Duncan as the manager of a car-racing team, was quite convincing (James Dean plays a major part both here and in Jack C. Haldeman II's "South of Eden, Somewhere near Salinas," testimony to just how long-lived a romantic image can be). Nicholas A. DiChario once more proves his immense talent with "Would He Do Woody?" a very nice take on Charlie Chaplin and the silent treatment. In "Ars Longa," Nancy Kress shows just how perverse a do-gooder's effects can be when she lets one of Walt Disney's childhood teachers recognize his talent and horn in on his life. Lawrence Schimel's "Mother, Mae I?" makes Mae West a nun and hands her a unicorn to amusing—though a bit cryptic—effect. Dean Wesley Smith considers alternate realities with Wallis Simpson and has one of the best stories in the book with "A Bubble for a Minute." What Janet Kaplan does to Dan Quayle in "Space Cadet" is pretty obvious, but it's still fun. There are more too—the ubiquitous Elvis, Hitler, Amelia Earhart, Red Skelton (my own contribution)—and if I don't mention them, it's because I'm just touching high spots, and not necessarily all of them.

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* * *

Charles Sheffield's **Dancing with Myself** is a collection of stories and popular science articles that—even though it lacks the columns—reads like a good example of this magazine.

Not surprised? Neither am I, for Sheffield appears frequently in *Analog* and indeed several of the book's stories were first published here. This familiar material includes "The Grand Tour" (bicycle racing in space), "The Double Spiral Staircase" (alien blueprints hidden in DNA), "C-Change" (we've been quarantined by a slow speed of light), "Godspeed" (can a ftl drive really destroy our piece of the Universe?), and the title story (a DNA repair gimmick homogenizes humanity). Stories from other magazines include "Out of Copyright," a nice treatment of what cloning might mean for business; "Tunicate, Tunicate" and "The Courts of Xanadu," both rather musty SF horror stories; and "A Braver Thing," of necessary plagiarism versus honesty at the Nobel banquet. The articles deal with infinities, quantum paradoxes, chaos theory, disasters, and universal history.

I like the title. *Analog* is what it is because it is the hall where every four weeks a new *corps de ballet* dances with the potentialities of science. Sheffield is one of the few who can do it all—both the science and the fiction—himself.

It is now almost a decade and a half since Walter and Luis Alvarez discovered excess iridium in the layer of grayish rock that marks the K-T boundary (between the Cretaceous and Tertiary eras), when the dinosaurs (and many other species) disappeared and the mammals began their rise to prominence. Since then it has become more and more apparent that the iridium had to arrive as part of an asteroid or comet about six miles (10 km) across. The resulting impact and its aftereffects were a cataclysm quite potent enough to extinguish as many as 65-70 percent of all the species then alive, making the event a "mass extinction" that truly deserves the name.

Our attempts to figure out what happened led directly to the "nuclear winter" computer simulations and helped drive the likelihood of nuclear war down. Our awareness of the K-T impact and its effects has also led to better understanding of why and how species go extinct and the implications of extinction for evolution. Finally, it has scared the socks off all those who realize that such impacts are common on a geological time scale and not only can but *will* happen again. The only question is when.

David Raup, a paleontologist at the University of Chicago, has written two books that anyone interested in the topic must read. The first, *The Nemesis Affair* (ISBN: 0-393-30409-4), came out from Norton in 1986 and was still available a year ago, the last time I used it in a course. The second, *Extinction: Bad Genes or Bad Luck?* came out from Norton in 1991, is more current and more general, and costs $9.95 (ISBN: 0-393-30927-4).

Still more recent (fall 1993) is Jeff Hecht's **Vanishing Life: The Mys-**

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tery of Extinctions. Jeff is a science writer whose work appears in *New Scientist* (and other places). He has followed the impact story since its inception, and now he has produced an admirably complete and even-handed summary of the history of life, fossils, extinctions both massive and puny, and the many mechanisms that can cause extinctions, including human actions. Its greatest defect is its brevity, for the story it tells is a fascinating one.

The book is aimed at younger readers, apparently at about the high-school level, but it should also interest older ones coming to the topic for the first time.

BOOKS ON DISK

Have you been wondering what happened to the Library of Tomorrow, the on-line fiction collection that would let you read all you wanted for just $4.95 a month? I plugged it here, and I presume you heard about it elsewhere too, but you haven't been able to get it, have you? Apparently, the interest needed to support it just wasn't there. As Brad Templeton (the fellow behind it) told me over the phone, reading a book on your computer may be the wave of the future, but it isn't the wave of the present.

On the other hand, when he went to the WorldCon last September, he sold out his "**Electric Science Fiction" 1993 Hugo & Nebula Award Anthology** CD-ROM disk loaded with 1993's award-nominated and award-winning fiction and artwork, with video interviews, samples of fan writing and cartoons, and more. I gave contents, price, and ordering data in the January column (very briefly: it costs $29.95, and you can order by calling 800-673-3726 if you can't find it in your local software or CD-ROM shop). Now I can tell you a little more, for he sent me a copy of the CD-ROM, and I found the apparatus to run it.

The package installs itself very easily under Windows (just follow the instructions). It then responds quite briskly to your attempts to navigate through it—even if, like me, you aren't used to using a mouse and icons—and shows off some very satisfying talent at displaying artwork (sometimes showing typical computer-art graininess of texture), text (very crisp and readable images), and even action. The least satisfying aspect of the package is the table of contents, which is split between the menu-bar and the screen so that you may have to hunt for what you want; I find it very easy to imagine a more useful, intuitive arrangement, such as a branching tree diagram. Then you could quickly find, for instance, the jokebook now hidden behind "Other" and "Bonus material" labels (being the sort of person I am, I immediately chose the "Nasty jokes" section—complete with "Offensive material" warning labels—and howled with laughter).

Templeton has done a very nice job of editing and packaging—even considering the table of contents—and the price is a phenomenon all by itself. He has shown us all just how good "digital publishing"

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can be. If you're a fan—or a library—with a CD-ROM system for DOS, Windows, or the Mac, this is something you've just got to have. Try it, and you will immediately find yourself praying that this anthology becomes a yearly event and runs forever.

If your vision is less than perfect, you will be even happier, for text on a computer screen can be much, much easier to read. (With the right software, your computer can even read aloud to you, but I don't know whether or how well this package works with speech synthesizers). ■

IN TIMES TO COME

Analog is, as the title says, a magazine of science fiction and science fact—and sometimes those parts interact in unexpected ways. Back in November 1992, John Cramer devoted an "Alternate View" column to "Centrifugal Forces and Black Holes." "Centrifugal force" is a tricky concept, of course; sophomore physics majors like to show off their superior knowledge by pointing out that it isn't *really* a force, but an illusion produced by a particular choice of coordinate systems. But if you're in certain situations it sure *feels* like a force, and it can act mighty peculiar in the vicinity of a black hole. John ended his column by speculating on conditions under which a human might get to experience that peculiar behavior first-hand, concluding, ". . . he might live to tell the tale. And that is a tale that I'd like to read, somewhere, sometime. . . ." Well, Robert R. Chase has written it, and it's our cover novella for June. This one's for you John,—and for all the rest of you who are fascinated by the really strange things that can happen in really strange places!

We'll also offer a variety of shorter fiction, the suspenseful conclusion of P. J. Plauger's *Wergild,* and the latest of Geoffrey A. Landis's "Vision-21" symposium reports, this one on the future of robots and humans as seen by a panel including Vernor Vinge and Hans Moravec.

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Brass Tacks

Dear Mr. Paul Birch;

I don't suppose I'm alone in being amazed by your response to my letter in the August *Analog* "Brass Tacks." I wasn't sure how to react, or if I should. It might seem impertinent for someone of my limited background to contradict a man of your stature, but then my silence might be interpreted as acquiescence.

Two possibilities occur to me.

First—that your answer to my remarks was "all in good fun" after all; that you were being deliberately provocative in order to incite a lively discussion in *Analog*'s pages, and I hope you succeed.

The second possibility is that you were being absolutely sincere, which bothered me, and not just because I disagree with you. Since your possible sincerity has the effect of moving the entire thrust of your original article into the realm of religion, not science, I was compelled to say something.

While I'm neither equipped to debate your science nor am I inclined to argue your beliefs, I can raise a red flag when the latter appears to be masquerading as the former. Like most of us, I have my own view of things, but cannot marshal an army of facts and authorities to support me as you obviously could. However, I seem to be equally unable to have unpleasantries fall into my blind spot.

No Malthusean trap? No limits on growth? But 212 trillion humans here on Earth?! As a scientist, surely you must know how indefensible such statements are.

When you wrote, "I believe we must fill the Universe and subdue it, because God made it for us and commands us to. . . ." it certainly sounds like a statement of religious faith. Could it be that you have raised the admonition in Genesis to "be fruitful and multiply" to the status of dogma and a new religion of Manifest Destiny? If so, may I point out that, while that verse may have been appropriate, thousands of years ago for a small, persecuted ethnic minority, it is hardly the kind of advice you'd give to people in an overcrowded lifeboat.

No amount of denial will convince me that the terrestrial environment has been improved, not spoilt. The air quality alerts that concern me as the father of active children, the cancer epidemic that affects more and more of my loved ones, the loss of nature's beauty and diversity as habitats fall to man's might, and the widespread hunger, genocide and unrest in the

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world today are all evidence that's hard for me to ignore. In fact, I take it as compelling proof that Malthus was right.

I don't doubt that science and technology has made it possible for more of us to live well than could have without it, but religious adherence to the dogma of constant human expansion and progress is just that—religious adherence.

If the scientific method is the approach we agree to use as we progress as a species in a material Universe, we ought not allow ourselves to abandon it selectively, when it appears to conflict with articles of faith. I wouldn't deny you, or anyone their beliefs, but I can expect the scientists among us to respect the physical realities that confront us.

JOHN VESTER

Rancho Cordova, CA

Dear Stan,

Thank you for the opportunity to write about Chad Oliver, whose death on August 9, 1993, was a great loss to all of us here.

I met Chad at a science-fiction convention in 1973 and wasn't disappointed. A dozen years earlier, I'd read his novel, *Mists of Dawn*, and both it and his by-line had stuck in my mind. Chad Oliver: what a perfect name for an SF writer. And what a perfect SF writer to go with such a name: tall, robust, droll, affable, and sported horn-rimmed glasses, a pipe, and a plateau of distinguishedly gray hair.

At that time, young Texas snotnoses such as Howard Waldrop, Bruce Sterling, Lisa Tuttle, and I were selling our first stories and making all the commotion we could. Chad found himself cast in the unasked-for role of Dean of Texas Science Fiction writers. He seemed fairly amazed by our numbers and the suddenness of our emergence; he had, he told us, been *alone* for so long. We took to him like, well, rambunctious puppies, and he responded with impersonations of cranky-old-fart scientific-tioneers, dead-on parodies of Edgar Rice Burroughs ("They say there is no life on Mars, yet—here I am!") and Ray Bradbury ("It was all the ice-cream cones that I had ever been or would ever be"), and anecdotes about palling around with Bradbury and Charles Beaumont in Los Angeles and about his field trip to Kenya, where he'd acquired material for the best of his sf novels, *The Shores of Another Sea*, and a wonderful nickname: Bwana Rocket.

He was keenly interested in our budding lit'r'ry careers and regularly attended our writing workshops. His good-natured professorial way of dispensing incisive criticism contrasted sharply with Bruce's and my take-no-prisoners approach, but, then, he didn't have anything to prove. In such works as *Shadows in the Sun* and *The Winds of Time*, he had created and defined a vital subgenre, anthropological sf; one of his non-sf works, *The Wolf is My Brother*, had won the Golden Spur Award for Best Western Historical Novel in 1967.

Chad's various relationships with us eventually spilled over into other areas of life. He and Howard became devoted fishing buddies. He and I

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liked listening to old big-band music and arguing about who was the better clarinetist, Benny Goodman or Artie Shaw; conversation would go on till all hours of the night and get off, somehow, onto subjects like love, children, his good and bad times and mine, too, and death.

His long-running fight with cancer started in the late 1980s; he slept through my last visit to his bedside and died late the following night. His comportment throughout his illness was in character. His sense of humor grew very dark, but he hung on to it, and to his innate graciousness, as long as he could. When, at last, they did slip away, I believe he was ready, even determined, to slip away from them.

STEVEN UTLEY

Dear Mr. Schmidt

Regarding G. Harry Stine's September 1993 Alternate View, entitled "Cities, Food, and War," I'm afraid his central thesis, that armies and warfare were necessary to stimulate the rise of the first cities, is not borne out by recent archaeology.

The practice of warfare by an ancient (or modern) society leaves many kinds of evidence. There is the physical damage of war, from the ashes of burnt buildings to marks made by weapons on skeletons. There is war's equipment, including weapons, armor, and fortifications. There is the location of building sites more for defensibility than for convenient trading or farming. Finally, there is representation of war and war-related matters in the society's art and writing.

For a long time, the civilization of Minoan Crete (about 2000-1500 B.C.E.) was considered anomalous because it was clearly a well-organized urban society with large buildings, highly developed art, bronze technology, a wide trade network, writing, bureaucracy—everything, in short, that we might expect in a highly civilized ancient people—except for one thing: there was no evidence of war. Later research has revealed that Minoan Crete was not unique in this respect but was merely the last (and perhaps most advanced) island-sheltered survival of a much more widespread ancient pattern. Excavation of numerous sites in the Near East, Anatolia, and southeastern Europe has shown that a similar culture, without the bronze or the big towns but with a comparable trade network, developed arts, and a rudimentary script, was common to the entire region up to around 3500 B.C.E. The Sumerians, once regarded as the originators of civilization, turn out to have been fairly late comers.

The arrival of warfare, beginning about 3500, was accompanied by a kind of cultural backsliding. Settlements became smaller; art declined; material wealth was reduced and was more concentrated in the hands of a chiefly few. The one area in which advances continued to be made was in metalworking technology, needed to develop better and better weapons. When civilization finally began to recover (which is when earlier archaeologists thought it was first getting started) it looked more or less as

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described in "Cities, Food and War"; armies, conquests, the whole ugly business. But the first small cities had already happened. Civilization developed, not because of war, but in spite of it.

JOAN M. HOWE

Boston, MA

The author replies. . . .

Dear Stan:

Thank you for forwarding the letter of Joan M. Howe concerning my "Alternate View" column entitled "Cities, Food, and War." My central thesis was not that armies and warfare were necessary to stimulate the rise of the first cities. Ms. Howe did not read carefully what I wrote. I invite her dispassionately to take the time to do so. This time, remember that the word "food" was included in the title.

Usually, my alternate view does not follow the current agreement about the Way Things Should Be If Only We Cared A Little More About People. This philosophy can exist only in a cultural milieu of growing abundance. For millennia, people have struggled to live in a world where there wasn't quite enough of anything to go around, especially food. People in the past (and in most of the world today) were and are hungry most of the time. If you didn't have it and you wanted it, it was easier to take it from someone who did have it.

Regrettably, Ms. Howe doesn't reference her sources. That, plus the tone of her letter and her use of semantically loaded phrases, makes her response not a debatable one but a statement of ideology. I usually don't cite sources because of restrictions on available space. However, I'm happy to list mine, which is available for an SASE. I invite her to give us hers. I'd like to read them. For example, this is the first I've heard that the Sumerians were latecomers to the civilization business.

Of course the Minoan civilization showed no signs of war! It was on the island of Crete in the middle of the eastern Mediterranean Sea. It didn't have enough worth taking to justify mounting an amphibious expedition when the same resources were far easier to get closer to home. In short, it wasn't worth it even if you did win. The Minoan culture didn't last, however. Other people developed superior military and naval technology, including logistics. Then they were capable of coming after what the Minoans had and feeding their troops as they did.

Claiming that civilization developed in spite of war is indeed an alternate view itself and is an interesting result of viewing the world through peace-colored glasses. I'm afraid Ms. Howe has not supported her contention by the presentation of evidence. All of the references and documentation I've seen lead me to suspect revisionism on her part. If she can refute this suspicion by documentation, I'd be delighted to change my view and to do so in public. A fact is a fact, but let's make sure it's a fact and not be led into debates about the number of angels that can dance on the head of a pin. If archaeology and

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anthropology are indeed sciences, those who specialize in them must play by the same rules as other scientists.

This brings up another question: Does science beget ideology, or does ideology determine the data that can be observed and the hypotheses that may be formulated for test? PC science? And here I thought PC was an acronym for Personal Computer. . . .

G. HARRY STINE

Dear Mr. Schmidt,

My compliments for your editorial "Nouveaux Clichés" in the October *Analog*. I have often felt resentment at the attitude of literary critics who judge the value of a book or a novella exclusively by the amount of "human relations" and human character descriptions in such a work. I have also deplored the tendency of science fiction writers to bow to this attitude and to try, by hook or by crook, to work in these "human factors," even if they are immaterial to the main idea of their work.

Particularly in science fiction there are so many interesting ideas and fantasies possible that have nothing to do with "human factors." So why squeeze in these factors? I suspect that the "mandarins" among the literary critics belong to that group of students of the "humanities" who profess contempt for the physical sciences and scientists, and qualify them as "mere plumbers."

But why bow to that arrogant crowd? I suspect that in college they were unable to understand physics and mathematics and that their attitude is the result of mere spite!

I would also like to comment on that woman you mentioned, who canceled her subscription to *Analog* because "it failed to reflect her view that the world is a terrible place."

Well, in the first place I do not like such "prophets of doom." Sure, there are many terrible things, but there are also many good things and certainly many interesting things.

But, even more so, I thoroughly dislike people, who seem to think that everybody ought to share their judgment and is obliged to preach this judgment to the world:
"Woolst du nicht mein Bruder sein,
so schlag Ich Ihn den Schädel ein!"

These fanatics are, in my opinion, not only objectionable, but they are a danger to civilization.

In history it has led to bloodshed and war and to such excesses as the Inquisition, where people were tortured to death "To save their souls."

Like Nietzsche once wrote in his "Also sprach Zurathustra": "Whatever harm the wicked may do, the harm of the 'good' is the most harmful of harms!"

So she reckons that you, in your science fiction magazine, are obliged to trumpet in every number that "the world is a terrible place."

Well, this is it. I have been a subscriber since the early sixties and I still have copies since March 1966 (except one or two) but this is my first "letter to the Editor." I particularly like the "Science Fact" articles and "The Alternate View" and even "Probability Zero." (Note: None of them deal with "Human Relations").

RUDY KERKHOVEN

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R. H. Kerkhoven cdre (ret)
Gruttolaan 15
2261 ES Leidschendam
Netherlands

Dear Dr. Schmidt,

The October *Analog* was excellent. The two fact articles were fascinating and enlightening as usual. John Cramer's idea for a tachyon drive was just great! I expect to see it become a science fiction staple, at least until someone builds it for real.

I found most of the stories entertaining. I especially liked Grant Callin's "The Carhart Shale." And I loved John Maggard's cover for that story. It was striking in color and the detail drew me right into the picture. I would love to see more of the rover (I would really like three-view drawings from which to build a model). The story described it as an "ugly vehicle." Some might find Maggard's functional interpretation ugly, but I didn't.

I do have one minor quibble with the story. The first paragraph explains the presence of a human teacher by saying that the thousand kilos of PCs and monitors would have been prohibitively expensive to transport. I can go down to my local computer store today and buy a powerful PC that weighs about a kilogram, including batteries. In the near future, more powerful computers will weigh even less. This class of two dozen young Martians should have been easily equipped with twenty kilos or less of computers, at a cost that probably would be much lower than housing, clothing and feeding a human teacher.

No doubt many have pointed out that the "palette" in "Darwin's Children" should have been a "pallet."

Unfortunately, I just didn't believe Doug Beason's "To Bring *Down* the Steel." The floating asteroid was nifty, but once it was clear that they were going to smash the Capitol anyway, what was the politicians' motivation for changing the laws? Besides, politicians don't really need a particular building in which to act stupidly. There are silly laws passed in every state, county and city all the time. No, flattening the Capitol might be emotionally satisfying, but I just can't see it accomplishing anything except getting even more laws passed and spending more taxes to rebuild. (Now, if you squashed it while Congress was in session. . . .)

With all this nit-picking it sounds like I didn't enjoy the issue. Not true! It made me think and it made me smile. What more could I ask? I know you'll keep up the good work.

DAN THOMPSON

Huntsville, AL ■

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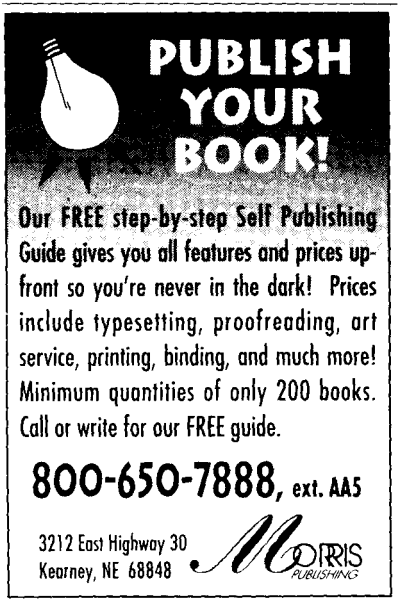
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UPCOMING EVENTS Anthony Lewis

22-24 April
AMIGOCON 9 (El Paso area SF conference) at Quality Inn Airport, El Paso, Tex. Author Guest of Honor: Roger Zelazny; Artist Guest of Honor: Dell Harris. Registration: $15 until 15 April; $18 at the door. Info: Amigo-Con 9, Box 3177, El Paso TX 79923. (915) 542-0443.

13-15 May
MARCON 29 (central Ohio SF conference) at Hyatt Regency, Columbus, Ohio. Writer Guests of Honor: Philip José Farmer and Barbara Hambly; Artist Guest of Honor: Boris Vallejó; Media Guest of Honor: Forrest J Ackerman; Super Guest of Honor: Julius Schwartz; TM: Barry B. Longyear. Registration: $26 until 1 April; $30 at the door. Info: Marcon 29, Box 211101, Columbus OH 43221. (614) 451-3154.

27-30 May
DISCLAVE '94 (Washington DC area SF conference) at Sheraton Premiere, Tysons Corners, Va. Guests of Honor: Lois McMaster Bujold and Steven Vincent Johnson; Special Guest: Darlene P. Coltrain. Registration: $30 until 30 April; $40 at the door (ages 6-12 $10, kids in tow $5, babes in arms free). Info: Disclave '94, John Sapienza, Box 677, Washington DC 20044.

27-30 May
BAYCON '94 (Bay area SF conference) at Red Lion Hotel, San José, Calif. Guests of Honor: Diane Duane and Peter Morwood; Artist Guest of Honor: Rick Sternbach; Fan Guest of Honor: Ray Nelson; TM: Laura Brodian Freas. Registration: $40 until 13 May; $45 at the door. Info: Baycon '94, Box 10267, San José CA 95157.

1-5 September
CONADIAN (52nd World Science Fiction Convention) at Convention Centre, Winnipeg, Manitoba. Guest of Honour: Anne McCaffrey; Artist Guest of Honour: George Barr; Fan Guest of Honour: Robert Runté; TM: Barry Longyear. Registration: $95 (C$125) until 31 December 1993; Supporting: $25 (C$30). This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition—the works. Join now and get to nominate and vote for the Hugo Awards and the John W. Campbell Award for Best New Writer. Info: Conadian, Box 2430, Winnipeg MB R3C 4A7 Canada or Box 7111, Fargo ND 58109 (204) 942-9494; FAX (204) 942-3427.

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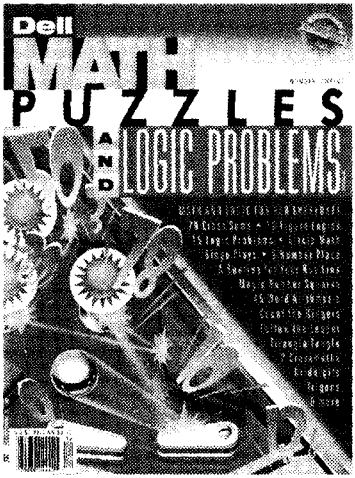

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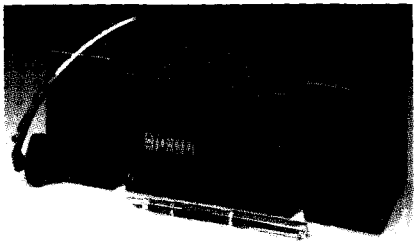

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